115031

Review of EPA Superfund Program
Proposed Plan
Metal Bank Superfund Site,
Philadelphia, Pennsylvania

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1.0 Introduction

In July 1995, the United States Environmental Protection Agency (EPA) issued a "Superfund Program Proposed Plan, Metal Bank Superfund Site, Philadelphia, PA.", (the EPA Proposed Plan). Environmental Science & Engineering, Inc. (ESE) was tasked with reviewing this document. ESE's review identified that the EPA Proposed Plan was based on **inappropriate conclusions and recommendations in the Remedial Investigation (RI), Feasibility Study (FS), and Baseline Risk Assessment (Baseline RA).** ESE determined **that EPA has developed a plan when, by correcting the deficiencies in the Baseline RA according to EPA guidance, no action is justified.** Finally, ESE has found that the EPA Proposed Plan consists of components from alternatives evaluated in the FS, but that the preferred alternative itself as well as a certain important component **has not undergone the level of detailed review normally required by EPA and routinely performed during the FS,** and therefore **is internally inconsistent, contains underestimated costs, and is ill-advised.**

Before reviewing the EPA Proposed Plan and preparing this comment document, ESE personnel first conducted an extensive review of the Feasibility Study (FS), prepared by Earth Technologies, Inc. on behalf of an ad hoc group of potentially responsible parties for the EPA [EARTH TECH, 1994a]. ESE also reviewed the Baseline Risk Assessment prepared by EPA [EARTH TECH 1994b, EARTH TECH 1995a, and EPA 1995b], the National Oceanic and Atmospheric Administration [NOAA 1994] and support contractors.

The RI/FS and the Baseline RA should be critical documents used to select a remedy for a site [EPA 1988, section 1.4]. The Baseline RA should identify those elements of the site (e.g chemicals, contaminated areas, migration routes) that pose the greatest risk and that must be addressed by the selected remedy. The FS should evaluate the possible combinations of steps (e.g. technologies, engineering controls, administrative controls) that reduce the site risks to acceptable levels. Together, these documents must justify the need for and the type of action to be implemented at a Superfund site.

ESE prepared two reports documenting its review of the FS and the Baseline RA of the Metal Bank site. These reports are entitled:

- Technical Review of the Health Risk Assessment Documents: Metal Bank/Cottman Avenue Site, Philadelphia, Pennsylvania, ESE September 1995 [ESE 1995a]

- Technical Evaluation of Remedial Alternatives for the Metal Bank/Cottman Avenue Site, ESE September 1995 [ESE 1995b]

ESE also reviewed a report prepared by Environmental Resources Management, Inc. [ERM 1995], entitled:

- Metal Bank/Cottman Avenue NPL [National Priority List] Site. Critical Review of Risk Assessments and Feasibility Study, ERM September 1995 [ERM 1995]

These three reports were used extensively while reviewing the EPA Proposed Plan, and are referenced throughout this comment document. These reports contain more detailed comments on the FS and the Baseline RA, and include:

- Recalculations of site risks to correct for EPA's improper use of regulatory guidance, and
- A detailed list of errors and discrepancies resulting from improper applications of EPA's own risk assessment guidance.

These reports are provided under separate cover and are incorporated herein. They must be reviewed in order to understand the full basis for ESE's subsequent comments on the EPA Proposed Plan.

ESE also reviewed several other documents from the Administrative Record for the Metal Bank site. These documents are included on the list of references provided at the end of this comment document.

1.1 General Comment

After conducting its review of the EPA Proposed Plan and the other documents, ESE reached the following general conclusions.

1. The EPA Proposed Plan contains statements that do not agree with the information in the primary source documents, the RI/FS and the Baseline RA.

2. The summary of pertinent site events is inconsistent with information presented in the RI/FS and in documents provided to ESE by Dr. Edward Kleppinger, the consulting scientist who has supervised much of the remedial activities at the site since 1981.

3. The EPA Proposed Plan discusses site conditions that are neither mentioned in nor supported by the RI/FS. Many of the conditions identified by the EPA Proposed Plan as requiring remediation are not supported by data contained in the RI/FS and other Administrative Record documents.

4. The Summary of Site Risks is based on a flawed risk assessment, one that does not comply with EPA's own risk assessment guidance. ESE's recalculations indicate that site risks are actually much lower than those used by EPA to justify further remedial actions. ESE calculated that there are no risks of regulatory significance, as identified by the National Contingency Plan (NCP) and EPA Guidance, associated with the exposure scenarios identified by the EPA. The basis for these conclusions is presented in the ESE report entitled "Technical Review of the Health Risk Assessment Documents: Metal Bank/Cottman Avenue Site, Philadelphia, Pennsylvania." [ESE 1995a].

5. Although the EPA Proposed Plan (Page 2) states that,

> "This proposed plan summarizes information that can be found in greater detail in the Remedial Investigation and Feasibility Study (RI/FS) report and other documents contained in the administrative record for the site,"

the proposed remedy is neither included nor evaluated in the formal RI/FS.

6. EPA has largely ignored the Remedial Action Objectives (RAOs) developed in the FS for the site. As a result, EPA has developed and selected a new alternative that addresses media (i.e. subsurface soil and groundwater) that, according to the RAOs, do not require remediation. Furthermore, because the objectives of EPA's preferred alternative are not clearly stated, the evaluations in the EPA's Proposed Plan are confusing and contradictory.

7. EPA has understated the difficulties in implementing the EPA's Proposed Plan, and the eventual costs are likely to be higher than those calculated. The benefits associated with implementation have not been demonstrated, and with respect to the mudflat program, there is serious doubt as to whether there are any potential benefits whatsoever, especially given the potential for environmental damage associated with sediment removal.

8. Other lower cost alternatives capable of providing the same measure of protection as achieved by the EPA's Proposed Plan are available. These are described in the ESE document entitled, "Technical Evaluation of Remedial Alternatives for the Metal Bank/Cottman Avenue Site." [ESE 1995b]

ESE's risk assessment review concludes that the site poses no significant threat to public health or the environment and, therefore, remedial action other than for site control (e.g. deed restrictions, security, etc.) are not appropriate.

2.0 Specific Comments

The remainder of this document contains ESE's detailed comments on the EPA's Proposed Plan. ESE's comments are organized to follow the format of the EPA's Proposed Plan. For example, ESE comments on the Site Background (EPA Section I) are provided in Section 2.1, comments on Section II - Scope and Role of Action, are provided in Section 2.2. This should minimize difficulties with cross-referencing against the EPA's Proposed Plan (Attachment A). References are provided in Attachment B or under separate cover as appropriate. Resumes of ESE staff who assisted in the preparation of these comments are provided in Attachment C.

2.1 Comments - Site Background

[JAG & CK]

COMMENT 1. NON-AQUEOUS PHASE LIQUID (NAPL) AREA (SITE BACKGROUND, PAGE 2, AND FIGURE 2).

EPA asserts that there is a large area, called the Non-Aqueous Phase Liquid (NAPL) Area, that is alleged to contain free-phase oil. This area is shown on Figure 2 of the EPA's Proposed Plan. EPA further asserts that this area is a source of polychlorinated biphenyl (PCB) contamination to the Delaware River. Since PCBs are immobile, they must be mobilized through the action of a transport media, such as an NAPL layer. ESE examined the RI and other sources to determine the basis for this figure and EPA's allegations regarding an NAPL layer at the site. ESE's opinion is that the RI data do not indicate that there is any NAPL layer present in which PCBs can be transported.

Liquid contaminants such as oil become mobile and create a NAPL when a sufficient quantity of contaminant is released into the unsaturated zone so that the residual saturation point of the contaminant in soil is exceeded [Fetter, Contaminant Hydrogeology, 1993]. Simply stated, enough liquid contaminant must be released so that the soil above the water table exceeds the residual saturation point and the soil cannot retain additional volume of contaminant. The remaining liquid then flows to the water table. If the material reaching groundwater has a specific gravity less than that of water (i.e. 1.0) then the material can form a floating layer, a Light NAPL (LNAPL).

When LNAPL is present,

1. A measurable layer of LNAPL should be present in monitor wells after the wells are developed, bailed, and purged,

2. Measurable concentrations of the LNAPL components that have some solubility should be present in groundwater immediately adjacent to the LNAPL area, and

3. Soil samples collected in the LNAPL area at and immediately above the water table should be saturated with the LNAPL and some water.

ESE did not find evidence that any of these three conditions exist at the Metal Bank site.

In the first case, groundwater monitoring information provided in the RI contradicts EPA's identification of an LNAPL Area. The RI contains statements [EARTH TECH 1994a, Sections 2.10 and 4.4] that some LNAPL was found in monitoring wells MW-4, 5, 6, 7 and P-10 in 1991 and 1992. However, when the results are examined closely, then there is substantial evidence to contradict the reports of LNAPL in wells. The RI [EARTH TECH 1994a, page 2-51] discusses sampling activities from May/June 1992 and May 1993:

> "Three wells that appeared to contain LNAPL in 1992 were measured with an electronic interface probe to obtain an estimate of LNAPL thickness as well as depth to water. Each of these wells was re-measured 24 hours after being purged, to obtain a more accurate measurement of LNAPL thickness. In each case, no LNAPL was found to have refilled the well, and 1993 measurements did not indicate the presence of LNAPL at all, even after a one-year interval."

This contradicts EPA's statement on Figure 2, Photograph #4 that:

> "The only recent LNAPL measurements were taken in 1991..."

The data throughout the RI actually indicate that no reproducible, measurable, LNAPL has been observed since 1991 at the latest. Since the wells were not bailed in 1991, even "the recent measurements in 1991" are not conclusive.

On RI pages 4-100 and 4-103 [EARTH TECH 1994a], statements are made that MW-7 and PW-10 contained no LNAPL after purging, and that wells MW-4 and MW-5 did not contain any evidence of product in 1992 even prior to purging.

The pattern reported in the RI is consistent with the mobilization of oil during monitoring well installation, and not the existence of LNAPL. Monitoring well logs indicate that several oil stained areas were encountered during the installation of the monitoring wells. Drilling a well through an area that contains some petroleum hydrocarbons has two effects. The first is that the process of drilling can transport petroleum components down to the water table. This can create conditions where some small amount of oil is found in newly installed wells, even though a LNAPL layer does not exist at the location. The second impact is that the drilling process temporarily destroys the capillary fringe and disrupts the cohesiveness of the soil encountered. Otherwise immobile oil bound within the soil then can enter the borehole and the well (see for example Testa and Paczkowski, 1989).

When this phenomenon occurs, oil droplets, sheens and even small amounts of 'measurable' oil can be observed in a well immediately after its installation. However, the observed amount of oil is greatly reduced over time because the oil mobilized by drilling is removed during development, purging and sampling, and there is little or no oil that is mobile in soil outside the area disturbed by the borehole that can move into the well. This is the pattern reported in the RI; evidence of oil is present in a few wells after installation and before purging, yet after sampling, the amount of oil is greatly reduced, and a year later little or no evidence of LNAPL remains.

Examination of EWK Consultants, Inc.'s [Mattioni, Volume II, Book 10] monthly reports to EPA regarding the operation of the oil recovery system at the site provides additional information that the mobile fraction of petroleum product at the site had been removed by 1989. During the later stages of the oil-recovery program, Delaware River water was pumped into a diked area encompassing most of the "EPA NAPL" area. This actively flushed the soil. As shown on Table ESE-1, over the last year of operation, 6 gallons of oil were recovered after pumping over 4 million gallons of water from the system (a ratio of 1.5 gallons "oil" per 1 million gallons of water pumped). No oil was reported during the last 6 months of operation.

Finally, as stated in the RI [EARTH TECH 1994a, Page 4-105]:

> "No 'oil seeps' (i.e. seepage of pure product) were identified during any of the field work in 1991, 1992, or 1993."

Therefore, there is no direct evidence that PCB-contaminated oil is present in a LNAPL layer at the site, is mobile, or is discharging to the Delaware River.

TABLE ESE-1. SUMMARY OF OIL-RECOVERY PROGRAM OPERATIONS OVER THE LAST YEAR OF OPERATION. METAL BANK SITE, PHILADELPHIA PENNSYLVANIA.

MONTH	GALLONS OF WATER PUMPED	GALLONS OF OIL RECOVERED
April 1988	399674	2
May 1988	443247	1
June 1988	396939	0.5
July 1988	331990	0.75
August 1988	354361	1
September 1988	387275	0.50
October 1988	341205	0.25
November 1988	314062	Trace
December 1988	108872	0
January 1989	245025	0
February 1989	316983	0
March 1989	283000	0
April 1989	141210	0
Subtotal	4,063,843	6

Source: EWK Consultants, Inc., Mattioni, Volume II, Book 10.

The RI also contains information that the second condition indicating LNAPL is not met at the Metal Bank site. In addition to the lack of conclusive, direct observation of an LNAPL layer at the site, groundwater samples from monitor wells throughout the site show low levels of the dissolved components of LNAPL, opposite what is expected if LNAPL conditions exist at the site. Sampling results from 1991 show low concentrations of petroleum hydrocarbons (TPH) present in groundwater samples [EARTH TECH 1994a, Table 4-30]; however, only the TPH result from

PW-10 is elevated when compared to wells upgradient (MW-1, MW-14, and MW-15). Even then the PW-10 concentration is much lower than expected from a sample collected within the area EPA maintains contains LNAPL.

In 1992, [EARTH TECH 1994a, Table 4-30] only MW-6, MW-7 and PW-10 reported detectable quantities of TPH. If LNAPL conditions were present, then substantially higher TPH concentrations would be expected in groundwater samples from monitor wells in and immediately downgradient from the area alleged to contain the LNAPL. Therefore, the dissolved concentrations of TPH in groundwater do not support EPA's contention that LNAPL exists at the site.

Finally, soil samples collected during the RI do not indicate that LNAPL is present on the water table at the site. Soil samples collected immediately above or across the water table do not show concentrations of TPH approaching the almost saturated concentrations that would be expected if LNAPL conditions were present. Data taken from soil borings within the EPA identified "NAPL AREA" are summarized on Table ESE-2 [EARTH TECH 1994a, Table 4-11].

TABLE ESE-2. SUMMARY OF REPORTED TPH RESULTS FROM SAMPLES COLLECTED IN "NAPL AREA" IDENTIFIED BY EPA.

SAMPLE LOCATION AND DEPTH	REPORTED TPH CONCENTRATION mg/kg	PERCENTAGE
B14 at 12.5 feet	4,080	0.41
B15 at 10.5 feet	10,800	1.08
B16 at 11.5	1,416	0.14
B17 at 12.5 feet	4,160	0.42
B18 at 14 feet	10,000	1.00
B22 at 14 feet	9,770	0.98
B23 at 10.5 feet	13,600	1.36

Source: EARTH TECH 1994a, Table 4-11.

As shown, the highest concentration of TPH reported in samples taken at the water table in the "NAPL Area" is 1.36%. These readings are not indicative of a LNAPL layer as maintained by EPA.

The sample results shown on Table ESE-2 are consistent with the field records collected during the RI. Examination of 1991 and 1992 soil boring logs from the RI [EARTH TECH 1994a, Volume 2 Appendix A] did not identify evidence of saturated conditions at the following locations within the EPA identified "NAPL zone":

- B16, SB-101, SB-102, SB-103, SB-104, SB-105.

Field observations of soil conditions performed during the RI do not support either the existence or the extent of the EPA "NAPL Area" as shown on EPA Figure 2.

Therefore, the RI does not provide information establishing the existence of any of the three conditions expected if a LNAPL layer exists at the Metal Bank site. ESE concludes that EPA's identification of an LNAPL layer, and their plan to implement a remediation system to prevent the migration of a LNAPL layer, is not justified by the available information.

Appendices A and B of the FS [EARTH TECH 1994a] attempted to calculate a residual saturation concentration value for TPH in the soil column that would indicate conditions where residual saturation were exceeded, and theoretically where LNAPL conditions might be created. These calculations were based in part on soil column studies run in the laboratory.

The calculations in the FS [EARTH TECH 1994a] concluded that a concentration of between approximately 9,000 mg/kg and 12,000 mg/kg would indicate residual saturation. As discussed, the basis for the calculations are soil column studies performed in the laboratory using uniform soil types under carefully controlled conditions. These studies are not representative of the type of disturbed, heterogeneous conditions present at Metal Bank, where most of the southern portion of the site is urban fill. Nor do these studies mirror the now weathered, mixed transformer oil which was released at the site. This dependence on lab studies that do not represent actual field conditions has a major impact on the calculations of residual saturation that might exist at the Metal Bank site.

To indicate the potential impact that variations between the field conditions and laboratory studies might have, ESE researched several sources and determined that column studies vary widely on the range of possible values for several of the parameters used by EARTH TECH. ESE performed several calculations to illustrate the possible impact of using other values from within

the reported range for residual saturation values. These calculations, summarized on Table ESE-3, are based on the same original study performed by Testa and Paczkowski [1989] referenced in Appendix B of the FS. In their report, the values of 15% apply to diesel and light fuel, and 20% apply to lube and heavier fuel oil.

Fingerprint analysis on Metal Bank samples [EARTH TECH 1994a, Volume 2 at "1993 (Subsurface) Soil Boring Data"] identify the type of petroleum hydrocarbon as:

- Mid-range lube oil,
- Fuel oil # 6,
- Lubricating oil, and
- Lubricating oil and coal tar.

← [OK ... HIGHLIGHT]

Based on this, ESE used a value of 20% as the residual saturation value for soil at the Metal Bank site. ESE also used a value for the specific gravity of 0.8, based on a report WESTON prepared for EPA in 1980 [WESTON 1980].

Based on ESE's calculations, conditions under which the oil concentration in the soils might exceed residual saturation would be indicated by TPH concentrations on the order of 30,000 parts per million (ppm), or 3 %. This is about 3 fold greater than that calculated by EARTH TECH.

Highly variable site conditions could have a significant impact on the actual values for residual saturation at the site. This is illustrated on Table ESE-4.

Therefore, it is not appropriate to base a conclusion that LNAPL exists at the Metal Bank site using primarily a calculated value for residual saturation. This is especially true when the actual observations from field records, monitor wells, and groundwater samples indicate that a LNAPL layer does not exist.

Identification of LNAPL was based on TPH detections, which do not necessarily correlate with PCB detections. It is PCB concentrations, not TPH, which are driving remediation according to the EPA. EPA provides a memorandum to file [EPA 1995], which compares PCB levels with TPH levels at the Metal Bank site, and concludes that there is no correlation between the two materials. It states that:

> "the PRP's [potentially responsible parties] criteria for remediating PCBs based upon TPH values exclusively was faulty".

Table ESE 3 - Example Calculation of the Total Petroleum Hydrocarbon Concentration At Residual Saturation for Soil at Metal Bank

Objective: Total Petroleum Hydrocarbon (TPH) value which is the mass of oil at Residual Saturation (per unit volume) per mass of soil (per unit volume)

Assumptions:

A	Residual Saturation Value (RSV) for Oil [1] =	20%
B	Porosity (n) of soil [2] =	35%
C	Mineral oil density (MO SG) [3] =	0.8 kg/L
D	Dry density of soil ρ_d [4] =	1.7 kg/L

Calculation

E Mass of oil at Residual Saturation (RCO) = RSV * n * MO SP

or

A * B * C

Mass of oil at Residual Saturation = 0.056 kg/L

Calculation: TPH concentration at residual saturation

$$TPH = \frac{\text{Mass of Oil per unit volume}}{\text{Mass of Soil per unit volume}}$$

TPH = RCO * ρ_d

or

E / D

TPH = 0.03294 kg/L oil/kg/L soil

or

TPH = 32,941 ppm

Notes: 1 - Testa and Paczowski, Volume Determination and Recoverability of Free Hydrocarbon, Ground Water Monitoring Review, Winter 1989

2 - Holz and Kovacs, Introduction to Geotechnical Engineering, 1981

3 - Weston, Evaluation of Alternatives for control of PCB contamination at the Metal Bank of America; March1980, Prepared for U.S. Coast Guard

4 - Holz and Kovacs, Introduction to Geotechnical Engineering, 1981

Table ESE 4 - Sensitivity Analysis Calculation of the TPH Concentration At Residual Saturation for soil at Metal Bank

Objective: Sensitivity analysis of TPH

Assumptions:	Original		Variables	
Residual Saturation Value for oil [1] =	20%			
porosity of soil [2] =	35%			
Mineral oil density [3] =	0.8	kg/L		
Dry density of soil [4] =	1.7	kg/L		
Scenario I - Vary the Porosity			Scenario A	Scenario B
Residual Saturation Value for oil [1] =	20%			
Porosity of soil [2] =	35%		25%	45%
Mineral oil density [3] =	0.8	kg/L		
Dry density of soil [4] =	1.7	kg/L		
TPH =	**32,941**	**ppm**	**23,529**	**42,353**
Scenario II - Vary the Soil Density				
Residual Saturation Value for oil [1] =	20%			
Porosity of soil [2] =	35%			
Mineral oil density [3] =	0.8	kg/L		
Dry density of soil [4] =	1.7	kg/L	1.5	1.9
TPH =	**32,941**	**ppm**	**37,333**	**29,474**
Scenario III - Change values to reduce possible TPH concentration to lowest value				
Residual Saturation Value for oil [1] =	15%			
Porosity of soil [2] =	25%			
Mineral oil density [3] =	0.8	kg/L		
Dry density of soil [4] =	1.9	kg/L		
TPH =	**15,789**	**ppm**		

Notes: 1 - Testa and Paczowski, Volume Determination and Recoverability of Free Hydrocarbon, Ground Water Monitoring Review, Winter 1989

2 - Holz and Kovacs, Introduction to Geotechnical Engineering, 1981

3 - Weston, Evaluation of Alternatives for control of PCB contamination at the Metal Bank of America; March1980, Prepared for U.S. Coast Guard

4 - Holz and Kovacs, Introduction to Geotechnical Engineering, 1981

In addition, PCBs are immobile and not a NAPL, and can only be mobilized through the action of a transport media. Mobile TPH would potentially act as that media. Without a transport media, there is no means by which PCBs migrate, and therefore no risk. Remediation areas should be based on the presence of both PCBs and LNAPL.

There is ample evidence, using recent sampling data, conservative calculations of residual soil saturation, groundwater monitoring results, and recovery system operational data, to conclude that an LNAPL area that is mobile and can transport PCBs as shown by EPA does not exist at the Metal Bank Site. ESE concludes that EPA's identification of an LNAPL area is not supported by the data presented in the RI. Therefore, there is no reason for a remediation plan for the site that includes mechanisms to control LNAPL which the data has been shown to not exist.

COMMENT 2. POLYCHLORINATED BIPHENYL (PCB) "HOT SPOTS" ARE IDENTIFIED BASED ON AN INAPPROPRIATE APPLICATION OF POLICY-BASED CLEANUP STANDARDS INDEPENDENT OF CALCULATED RISK (SITE BACKGROUND, PAGE 2). [Jay & Roy]

EPA states that there are PCB "Hot Spots," that will continue to be a source of PCBs entering sediments and the Delaware River via groundwater flow. As discussed below, ESE's review of the information available has identified data contradicting EPA's position. ESE found that the cleanup level proposed by EPA is inappropriate, because it is based on a direct contact exposure scenario that is not present at the site. In addition, the cleanup criteria is a policy-based number and not based on the calculated risk. This is an inappropriate application of EPA policy and guidance. ESE [ESE 1995a, sections 4 and 5] also concluded that the PCBs remaining at the site are not at concentrations calculated as posing a risk to the River as represented by EPA; therefore, remedial measures to address PCB "Hot Spots" are not appropriate.

EPA proposes to dig up PCB "Hot Spots", and fill them with material dredged from the mudflats. EPA defines "Hot Spots" as those areas containing over 25 ppm PCBs. ESE's review of the EPA's Proposed Plan and other documents found no basis for this cleanup level. EPA's Proposed Plan (page 14) references the Toxic Substance Control Act (TSCA) PCB management policy for non-residential soil as justification for the 25 ppm cleanup level. The following statement is found on page 16:

> "EPA has considered the Spill Policy (40 CFR 761.120 - 761.135, Subpart G) and the EPA guidance document entitled "Guidance on Remedial Actions for Superfund Sites with

> PCB Contamination" (EPA/540/G-90/007, August 1990) in its determination of cleanup levels. The recommended cleanup standards for PCBs in the subsurface soil, under these guidance, are (a) 25 to 50 ppm for industrial or other reduced access areas; and (b) 0.1 to 10 ppm for residential areas. However, the guidance allows flexibility when formulating cleanup levels based on risks."

EPA's application of the referenced guidance and policy is inappropriate for many reasons. One is that the 25 ppm to 50 ppm range, as stated in the Spill Policy, is based on the risks associated with direct contact with PCBs. Yet, on page 14 of the EPA's Proposed Plan, EPA makes no mention of a direct contact threat from the PCB "Hot Spots." Instead it discusses the threat as PCBs in the "Hot Spots" being mobilized and entering the River:

> "PCBs may migrate into the river when rainwater, groundwater or tides from the Delaware flush the PCB-contaminated soils underneath the Site. If the contaminated river sediments are removed, they could be contaminated again because there are source areas within the Site that contain levels of PCBs above 25 ppm. These source areas are called Hot Spots and will present a continuous threat if they are not removed from the Site."

Therefore, EPA appears to be applying standards based on policy developed for direct exposure to people when the threat it identifies is based on an unsubstantiated exposure of aquatic organisms to PCBs migrating from the "Hot Spots" and entering sediments. EPA acknowledges the absence of any real risk from the PCBs via direct contact on page 16:

> "However, since the PCBs are deep within the subsurface soil, skin contact is nearly impossible. This combined with other physical barriers such as a perimeter fence and a soil cover, will further eliminate human access to the PCB contamination."

EPA's application of a direct contact cleanup criteria at a site where EPA acknowledges skin contact is nearly impossible is an example of the inconsistent and inappropriate application of policy and guidance ESE has found throughout the EPA's Proposed Plan. This recurring problem may be the result of EPA developing a new alternative - C-7A, that has not been subject to a full evaluation during the FS process.

As stated in guidance, flexibility is allowed when formulating cleanup levels based on risk. Although premised on an alleged aquatic risk, EPA does not justify the 25 ppm number based on any showing of risk to the aquatic environment. No calculations or discussions are provided to show that cleanup of PCBs to the 25 ppm number in the "Hot Spots" is necessary to prevent

contamination of the sediments at levels calculated as posing a risk. The only explanation is found on page 16:

> "However, EPA is confident that after the removal of PCBs greater than 25 ppm, the monitoring programs will demonstrate residual PCB contamination leaching beyond the Oil-water Separators will not cause an exceedance of the chronic ambient water quality criteria (AWQC) value for freshwater life."

ESE found no information supporting this statement in the EPA's Proposed Plan or the primary supporting documents, the RI, FS or the Baseline RA. The supporting documents do not indicate that the low levels of PCBs found in the subsurface are or can cause an exceedance of the AWQC. ERM [ERM 1995, section 2.3.1.4] concluded that AWQC would not be exceeded by correct calculations of the impacts of groundwater discharge into the Delaware River.

In addition, since there currently is a soil cap at the site but no barriers to prevent tidal influence or infiltration of precipitation, then groundwater under the site should already contain PCBs being flushed from the soil, if EPA's concerns are valid. However, the RI data shows the opposite. Contrary to EPA's statement (page 16, last paragraph) that,

> "...PCB migration has been observed through the groundwater,"

the RI states that PCBs have a very restricted occurrence in groundwater [EARTH TECH 1994a, page 4-100], being found in only two wells, MW-6 and MW-7. The concentrations of the PCBs detected in these two wells are 12.3 and 25.6 ug/L in one well, and from below detection limits to 1.3 ug/L in the other. These results may actually represent samples of residual oil resulting from well installation (refer to Comment 1) and not only groundwater.

Monitoring wells are also located within two of the EPA "Hot Spots." These are at B-1/MW-1 and B-21/MW-15. RI Table 4-29 indicates that no PCBs were detected in either of these two wells [EARTH TECH 1994a], opposite what would be expected if EPA's theory regarding migration of PCBs from the "Hot Spots" is valid. This information indicates that PCBs are <u>not</u> being flushed from the soil in the "Hot Spot" areas.

The relative risk posed to the aquatic environment by the PCB concentrations in groundwater is illustrated by the fact that <u>PCBs were eliminated as a contaminant of concern by the NOAA during the screening process routinely performed for any Aquatic RA. NOAA thought it necessary to evaluate their contribution from groundwater only because "...they are of major concern at the site..."</u> [NOAA 1994, Page 3-2].

The relative risks to the aquatic environment are discussed in greater detail in ESE's review of the Baseline RA, [ESE 1995a Section 4] where ESE concluded that the risks posed from the levels of PCBs in the sediments were not calculated correctly and did not pose a risk to aquatic organisms, and that there was no discernable impact to the benthic populations documented as existing in the sediments adjacent to the site. The PCB issue also is discussed at length by ERM in [ERM 1995, sections 2.3 and 3.0]. EPA has not shown that the 25 ppm level is necessary to protect the aquatic environment, and ESE's calculations show that there is no risk at levels of regulatory concern and therefore no remediation is necessary.

There also is no reason to address the subsurface PCBs based on a potential risk to protect human health. As acknowledged by EPA, there is almost no potential for there to be direct contact to the subsurface PCBs. ESE's risk assessment review also concludes that the subsurface PCBs at the site pose no significant threat to public health or the environment. Therefore, actions other than for site control such as the barriers and perimeter fence mentioned by EPA on page 16 of the EPA's Proposed Plan are not appropriate [ESE 1995a, sections 3.6, 3.7].

Regardless of EPA's inappropriate application of a policy-based PCB cleanup number, ESE's evaluation of the various policies and guidance documents referenced in the EPA's Proposed Plan indicates that the basis for cleanup of PCBs at the site should be risk-based, and not policy based. Since the RI data and appropriate risk calculations do not indicate an unacceptable risk, then remediation of PCBs is not warranted. Authority for establishing a risk-based cleanup criteria for PCBs is discussed below.

EPA Guidance on Remedial Actions for Superfund Sites with PCB Contamination [EPA/540/G-90/007, August 1990] states that levels of 10 ppm to 25 ppm are to be treated as Preliminary Remediation Goals (PRGs). Exceedences of these PRGs does not mean that remedial actions are required. The PRGs are used to identify those areas where response action should be considered. The PRGs are based on preliminary site information, and therefore are used as starting points in setting parameters for the purpose of developing remedial alternatives. Because PRGs are designed to be developed early in the remedial evaluation process, they can only be based on readily available information. As additional information becomes available, the PRGs should be modified to reflect the increased availability of information and site specific data.

The Guidance (page 2) discusses the process for modification and selection of the final remediation goals in the remedy selection process (i.e. during the RI/FS process including the Risk Assessment phase):

> "[E]xceedance of a PRG for PCBs does not mean that action is required. Rather, once the CERCLA [Comprehensive Environmental Response, Compensation and Liability Act] program decides that action is necessary at a site, the PRGs for PCBs would be used to identify areas at which response action should be considered. These goals may be defined through the RI/FS process; final remediation goals are defined in the remedy selection." [EPA 1990, section 1.0].

The PRGs can be used to reduce the need for detailed site-specific risk assessments, but their application at a site such as Metal Bank where site specific risk assessments have already been performed (although incorrectly as pointed out by ESE) is not valid. If PRGs are to be used without consideration of site-specific conditions, then there is no need to perform risk assessments at a site, which is contrary to EPA policy, the National Contingency Plan, and other regulations. In fact, the Guidance requires that the final cleanup levels must still reflect all relevant exposure pathways and be defensible on a site-specific basis.

The Guidance indicates that where land use is industrial, the appropriate concentration at which to start analysis for soil is 10 to 25 ppm, since direct exposure is less frequent than for residential scenarios. Thus, higher concentrations will be protective [EPA 1990, Section 3.1.2]:

> "For example, at Superfund Sites located in industrial areas, ingestion and inhalation exposures are more limited than for a residential area. Even assuming exposure equivalent to that in residential areas, these levels (10 to 25 ppm) are still within the acceptable risk range (approximately 10^{-4}) based on the direct contact exposure pathways, and in fact will reflect a lower risk due to the reduced frequency of exposure expected at the site."

The EPA CERCLA Guidance explicitly states that PCBs within the stated range of 10 to 25 ppm are to be treated only as PRGs or "action levels," providing a starting point for developing site-specific cleanup levels:

> "The use of PRGs does not preclude development and consideration or selection of alternatives that attain risk levels other than those represented by the PRG."

Finally, the preamble [59 Fed. Reg. 62794] to the proposed comprehensive disposal regulations indicates that the upper range of the 10 to 25 ppm range is appropriate as the point of departure for industrial sites:

> "The guidance recommends that in most cases, the preliminary remediation goals (or "analytical starting points" for setting remedial levels) for PCBs in soil under CERCLA are as follows:...for industrial and other restricted access areas: 25 ppm..."

According to EPA's own guidance, 25 ppm should have been the appropriate starting point for selecting a site-specific cleanup goal for PCBs in soil. This number then should have been modified, (upward in this case based on ESE's risk evaluation as noted previously). Even without the corrections made by ESE, EPA's own risk assessment concluded that the remaining PCB concentrations do not represent a risk of regulatory significance, so no soil remediation for PCBs appears justified.

As another example of the internal inconsistencies throughout the EPA's Proposed Plan, neither the Proposed Plan nor the FS provide any substantiation for selecting 10 ppm for courtyard soil, and 25 ppm for southern area "Hot Spots." Further, EPA does not justify the decision to use 25 ppm as the standard for removing and disposing of unsubstantiated "contents" of the Underground Storage Tank (UST) (refer to Comment 7) merely to be consistent with the "Hot Spot" program. Rather, if any subsurface remediation would be recommended using a policy-based number, than the PCB disposal policy number of 50 ppm would appear to be more appropriate. In this situation, none of the southern area "Hot Spots" exceeds 50 ppm and no remediation would be required.

Basing remediation decisions on risk is consistent with other regulations addressing PCBs. Under the prefatory note to the PCB Disposal Rule, 40 C.F.R. Part 761.60 Subpart D, there is no requirement to remove PCBs placed in a disposal site prior to February 17, 1978. These PCBs are considered to be "in use" or "in service." The definition of "disposal", includes intentional or accidental discarding or throwing away of PCBs, and includes spills, leaks, and other uncontrolled discharges of PCBs. The PCBs at the Metal Bank site appear to be specifically excluded from removal, having been placed at the site, by EPA's own admission, between 1968 and 1973. Therefore, EPA's statements regarding the relevant and appropriate nature of the Disposal Rule (page 16) does not appear to be valid. It would only apply to any PCBs actually excavated, the need for which has not be demonstrated.

EPA seeks to revise the PCB Disposal Rule to base remediation on risk also. EPA's proposal to delete the note to 40 C.F.R. 761.60 continues the concept that PCBs spilled or released prior to April 18, 1978 are disposed of in a manner that does not automatically require remediation based on risk. For these site (i.e. with PCBs released prior to April 18, 1978), remediation is required when the Regional Administrator finds, on a case-by-case basis, that the site presents a risk of exposure. At that point, submission of an application for approval of a risk-based disposal

method can be required [Proposed 40 CFR 761.60, 59 Fed.Reg. 62788, 62858, December 6, 1994].

Further, EPA indicates that one reason for the proposed rule modification is to make Toxic Substance Control Act (TSCA) cleanups consistent with CERCLA cleanups. EPA acknowledges that there is no technical or environmental reason for having separate and inconsistent methods for remediating PCB spills under CERCLA, TSCA, and the Resource Conservation and Recovery Act (RCRA).

EPA is correct (page 16) in stating that the TSCA Spill Policy, 40 CFR 761, subpart G, applies to spills occurring after May 4, 1978. However, EPA's statement (Page 16) that the policy can still be used and is "to-be-considered" at a site such as Metal Bank is not supported. First, for old spill sites, the policy does not require additional cleanup where, as at Metal Bank, remediation of a spill has already occurred in accordance with requirements imposed by the EPA Regional Administrator. The Metal Bank site remediation was completed in accordance with the goals established in the 1983 Settlement Stipulation, as acknowledged by EPA [Approved, December 12, 1983 by James T. Giles, United States District Judge, United States District Court for the Eastern District of Pennsylvania]. Second, EPA recognizes that old spills which are discovered will require site-by-site evaluation. This again supports evaluation of the site-specific risks posed by a site prior to a decision to require remediation.

Requiring that remediation be based on the calculated risk also is consistent with the NCP, which states:

> "For known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess upper bound lifetime cancer risk to an individual of between 10^{-4} and 10^{-6} using information on the relationship between dose and response." [40 CFR 300.430(e)(2)(i)(A)(2)].

Finally, the acceptability of risk-based decisions is recognized under Pennsylvania law. Under Section 301(a)(3) of the Pennsylvania Land Recycling and Environmental Remediation Standards Act, ("Senate Bill No. 1"), development of risk-based cleanup criteria for sites is one of three methods that are available to establish the basis for remediation at sites within the Commonwealth.

As discussed above, ESE believes that the basis for using site-specific risk-based calculations to establish final cleanup standards is well established by regulation and guidance. ESE concluded that risk analysis performed correctly would have identified that there was no requirement to

address the PCBs in the Metal Bank soil [ESE 1995a, sections 3.6 and 4.3.5]. Therefore, remedial action is not appropriate to address the "Hot Spots" because there are no demonstrated significant risks to public health or the environment.

EPA appears to have inappropriately used a policy-based PRG and failed to modify this as called for by guidance and regulation for site-specific risks. PCBs were arbitrarily included as a groundwater contaminant of concern in the Aquatic RA without a sound basis. Data obtained during the RI demonstrate that PCBs are not being flushed from the soil. Therefore, ESE concludes that the identification of PCB "Hot Spots" in soil in the southern area based on a policy based number of 25 ppm is not justified. Further, the available information and ESE's recalculations of the risk assessment indicate that, if the PRGs had been appropriately modified, the PCB concentrations remaining at the site are not shown to pose a risk at levels of regulatory concern, so remediation is not required or justified.

ESE also identified other discrepancies and errors identified in previous documents that have been carried through into the EPA's Proposed Plan.

- EPA states that there are four PCB "Hot Spots" in the southern area. ESE's review of the information [EARTH TECH 1994a, Table 4-10] indicates that there are two areas where PCBs are above the 25 ppm threshold, and one area at the threshold. Of the four identified "Hot Spots": one area has one interval at 18 ppm (B1); one contains a boring with two consecutive intervals at 26 ppm and 42 ppm (B10); one has a duplicate sample that averaged 22 ppm (29 ppm and 15 ppm); and one area has a sample exactly at 25 ppm, which does not exceed the threshold.

- At three of the "Hot Spots," sample results indicate that the PCBs are limited to a small interval within the soil column.

These are discussed below.

EPA Figure 3 identifies areas considered "Hot Spots" by the EPA. However, the RI [EARTH TECH 1994a, Table 4-10] documents that the concentrations of PCBs exceed the 25 ppm at only two locations:

- At location B-1, where 28 ppm was reported at 10.5 feet.

- At B-17, where 26 ppm between 2.5 and 4.5 feet deep, and 42 ppm between 4.5 and 6.5 feet deep, were reported.

- At two other locations, the 25 ppm concentration is not exceeded. At B-21, two Aroclors combined are estimated to total 25 ppm (J flag on data), while at location SB-102, two Aroclors combined are estimated to total 24.6 ppm (J flag on data).

- At location B10, only one of two duplicate samples exceeds the 25 ppm criteria, and the average is only 22 ppm.

Sample results also indicate that the occurrence of "Hot Spots" is limited in extent.

- At B-1, samples did not identify PCBs in groundwater. Therefore, the PCBs identified in the soil sample in contact with water have not contaminated groundwater at that location.

- At B-21, sample results indicate that PCBs decrease to 6.5 ppm at the 6.5 foot interval, limiting the "Hot Spot" to at most a 3.5 foot interval [EARTH TECH 1994a, Table 4-10]. As mentioned, groundwater samples collected at this location did not identify PCBs, so the PCBs in this interval do not appear to be migrating to groundwater.

- At location B-17, samples limit the "Hot Spot" to not deeper than 10.5 feet [EARTH TECH 1994a, Table 4-10].

The last "Hot Spot" location reported by EPA, at location B-10, has duplicate samples reported as 29 ppm and 15 ppm reported at 8 feet [EARTH TECH 1994a, Table 4-10]. Therefore, the presence of PCBs above the 25 ppm threshold level is not conclusive at this location.

Based on this information, ESE concludes that the PCB "Hot Spots" are small and of limited extent. More importantly, groundwater samples indicate that the PCBs in the "Hot Spots" are not impacting groundwater.

Finally, much of the identification of PCBs at the site and their distribution are dependent upon field screening techniques. As pointed out by ERM [ERM 1995, section 2.1.1] there does not appear to be a correlation between the screening data and laboratory data in soil located within the courtyard. Basing identification of PCB distribution on field screening data is not appropriate if there is no correlation between the field and fixed laboratory results.

ESE concludes that the available information indicates that the so-called "PCB Hot Spots" are limited in extent and are not having a measurable impact on groundwater.

COMMENT 3. METAL BANK OIL LAYER AS THE MECHANISM BY WHICH PCBS ENTER THE RIVER AND SEDIMENTS (SITE BACKGROUND, PAGE 2).

[JAY & BRUCE]

EPA states that:

> "At this site, the LNAPL has been shown to be contaminated with PCBs. The oil layer has been observed to discharge to the river in the Mudflat Area and is believed to be the vehicle by which PCBs enter the river and sediments."

In addition to the information contradicting EPA's contention about an LNAPL layer, as discussed under Comment 1 above, ESE has identified four other items of information that contradict EPA's position regarding the PCBs and an oil layer.

- Documentation shows that PCBs are present throughout the Delaware River [ERM 1995 at sections 1.2, 1.4, 1.5, 2.3.1.3].

- Data from Figure 3 of EPA's Proposed Plan (S16, S23, S21, S22)] identifies that samples collected upstream from the Metal Bank site contain PCBs at levels similar to those downstream from the site. If a Metal Bank oil layer were the source of PCBs, higher concentrations should be found downstream from the site. This issue is further discussed in Section 4.3.4.5 of ESE's review of the Aquatic RA, and in Section 3.10 of ESE's review of the Human Health Rick Assessment [ESE 1995a].

- Data from the RI shows that riprap samples collected in 1991 that contain PCBs are identified as Aroclor 1260 [EARTH TECH 1994a, Table 4-15]. The riprap area is immediately adjacent to the site, and the area where EPA maintains that LNAPL and contaminated groundwater discharge from the site. Furthermore, the type of PCBs in onsite soil samples collected along the edge of the site closest to the mudflat and River (SB102, SB104, SB105), identifies Aroclor 1260 as the predominant type of PCB in soil nearest the site edge. This supports the identification of Aroclor 1260 as a "type" PCB for the site. Therefore, if EPA's theory is correct and PCBs are moving in oil from the Metal Bank site, then the PCBs in the mudflat and River sediments should be of the same type (i.e. Aroclor 1260).

  However, only one of the 20 mudflat samples collected in 1991 identifies any of the detected PCBs as Aroclor 1260 [EARTH TECH 1994a, Table 4-15]. Also, only one of the 14 sediment samples collected from the River in 1991 identifies any of the detected PCBs as Aroclor 1260 [EARTH TECH 1994a, Table 4-21]. Only one of

the mudflat samples taken in 1993 identifies Aroclor 1260 as present [EARTH TECH 1994a, Table 4-16]. The absence of a match between the type PCB for the site, Aroclor 1260 and the mudflat and River sediment samples supports the conclusion that the mudflat and River sediment PCBs are from sources other than the Metal Bank site.

This lack of Aroclor 1260 is significant since, in the environment, lower chlorinated Aroclors weather, indicating an increased chlorine content relative to the other components of the PCBs [Personal communication with Edward Kleppinger, Ph.D., EWK Consultants, Inc., August 1995]. The absence of Aroclor 1260 indicates that the PCBs did not originate at the Metal Bank site, and also indicates that the PCBs may not have been present for periods sufficient to produce changes characteristic of weathering.

- ERM, [ERM, 1995 at sections 2.1.4, 2.1.5, and 2.3.1.3] also found strong evidence that the mudflat and riprap sampling efforts did not support EPA's position that PCBs in mudflats originated at the Metal Bank site.

In addition, EPA acknowledges that there is no correlation between the TPH results, indicative of oil, and the PCB concentrations. If oil were the transport mechanism, then there should be a correlation between these two parameters. EPA provides a memorandum to file dated July 6, 1995 [EPA, 1995], which compares PCB levels with TPH levels at the Metal Bank site, concludes that there is no correlation between the two materials, and states that:

> "Therefore, the PRP's criteria for remediating PCBs based on TPH values exclusively was faulty."

In addition, PCBs are immobile and not a NAPL, and can only be mobilized through the action of a transport media. Mobile TPH would potentially act as that media. Without a transport media, there is no method for PCB's to migrate, and therefore no risk.

The information presented in the RI does not demonstrate that PCBs identified in mudflat and river sediments migrated in oil from the Metal Bank site. EPA's Proposed Plan fails to incorporate this information. EPA is proposing a cleanup of PCBs that have not been shown to be released from the Metal Bank site. After clean-up, continuing sources of PCBs from the River and possibly the combined sewer overflow [ERM 1995, section 2.3.1.3 and Appendix C] may

redeposit PCBs onto the mudflats, and no reduction of risk will have occurred after a multi-million dollar expense.

ESE's opinion is that the available data indicates that there is no oil layer at the site and, therefore, it cannot be the mechanism by which PCBs enter the river and sediments. Furthermore, information developed during the RI indicates that sources other than the Metal Bank site are responsible for PCBs in mudflats and the Delaware River. Therefore, any remediation program implemented by the EPA and targeting the sediments will not succeed because other ongoing sources of PCBs may re-contaminate the areas EPA proposes to "remediate."

COMMENT 4. EVIDENCE OF DENSE NON-AQUEOUS PHASE LIQUID (DNAPL) (SITE BACKGROUND, PAGE 2) [JAY & CK]

EPA suggests that variations in the PCB concentrations in borings SB-105 and SB-106 are indicative of DNAPL presence in the subsurface. Specifically, EPA's opinion is based solely on the observation that PCB levels at these two locations do not decrease with the first two to four feet of depth below the water table. This PCB distribution is expected based on the historical LNAPL release and the observed TPH distribution near the water table. First, PCBs were dissolved in the LNAPL and, as a result, their distribution in the unsaturated zone and near the water table would be largely a function of the LNAPL carrier oil. The TPH data collected during the RI provide evidence of residual (immobile) TPH remaining in the subsurface. In most of the borings conducted at the site, TPH concentrations are relatively uniform from the ground surface to a few feet below the existing water table. The detection of elevated TPH levels a few feet below the water table is a key observation and explains the presence of the PCB at similar depths. Water table lowering due to historical groundwater extraction activities and, to a lesser extent, seasonal hydrologic variations are likely the mechanisms by which petroleum contaminants became distributed below the present water table.

ESE concludes that EPA is not correct in evaluating elevated PCB concentrations near the water table as evidence of DNAPL. Rather, this pattern is consistent with the historic LNAPL situation that existed prior to remedial efforts, and with the effects of those efforts. Therefore, there is no reason demonstrated for further study to evaluate the presence of DNAPL, or for implementing a remedial program designed to prevent the migration of DNAPL.

COMMENT 5. SITE HISTORY. [ok]

Comments regarding the history of the site are presented by Metal Bank's counsel in a separate document.

COMMENT 6. TIDAL FLUCTUATIONS AND THEIR EFFECT ON THE SITE (PAGE 5).

[JAY, BRUCE & CK]

EPA states that there is a tidal influence on the groundwater levels under the site. EPA uses this observation to conclude that tides in the Delaware River have a flushing effect on the contaminants in the subsurface soil and also act as a transport mechanism.

However, the RI contains information that contradicts EPA's position.

- On RI Page 3-40,

  "Based upon the water level measurements (see Table 2-13) and the results of the tidal monitoring study (Figure 3-11), it appears that the only portion of the site that is tidally influenced (i.e., groundwater levels fluctuate with diurnal tidal cycles of the Delaware River) is the extreme southern margin of the site which lies directly adjacent to the Delaware River. During the tidal monitoring study, a tidal effect was observed only in monitoring wells MW-4 and MW-5."

- As shown by RI Figures 3-9 and 3-10, groundwater continues to move towards the River even at high tide.

These items contradict Figure 2A of EPA's Proposed Plan, which shows groundwater flow reversing.

Therefore, available information indicates that tidal fluctuations may have a <u>minimal</u> effect on the extreme southern portion of the site. However, there is no evidence to support EPA's statement regarding tides flushing contaminants from the soil because the groundwater samples collected from wells closest to the Delaware River and not affected by tides (e.g. MW-6, MW-7.) generally have lower concentrations than are found in upgradient wells.

COMMENT 7. THE STATUS OF THE UNDERGROUND STORAGE TANK CLEANUP AND PCB RESIDUES IN THE SURROUNDINGS (PAGE 5).

[Jay & Cesare]

EPA states that:

> "It is unknown if the tank was actually drained of all PCB fluids or if its surroundings are free from all PCB residues."

ESE identified several items contradicting this statement.

The site handled electrical transformers from 1968 until early 1973 [EARTH TECH 1994a, Page 1-8], when the UST was reportedly emptied. During a September 1977 inspection, several years after transformer operations were terminated at the site, an EPA environmental specialist observed that the buried 6,000 gallon tank was uncovered and full of water. Three to four inches of sludge were reported to have accumulated in the bottom of the tank. A manhole into the tank was subsequently discovered which was wide enough to permit direct sampling of the bottom sludge to determine if there was any PCB content requiring removal and disposal. A sample of the sludge was taken. Analysis showed that PCBs were present at a concentration of only 38 ppm. [EPA Hazardous Materials report 77-1005, October 28, 1977]. No action was required because this concentration was below the regulatory threshold.

This level is also below the 50 ppm criteria that EPA (Page 14) states later in the EPA's Proposed Plan triggers special handling and disposal options for PCB wastes under TSCA. The low level of PCBs in the sample indicates that PCB liquids, which were observed in all samples taken from wells in 1977-1980 (about 1,000 ppm) [personal communication with Dr. Ed Kleppinger, EWK Consultants, Inc., August 1995], were not present in the UST at that same time. Since this sampling took place **after** PCB operations ceased at the site, there is no mechanism to introduce PCBs liquids back into the UST after EPA's own samples confirmed that PCBs were not present above levels of regulatory concern in the tank liquid. Further, assuming that liquids containing PCBs were present in the UST during operations, then the sample taken in 1977 indicates that PCB liquids had been removed from the UST.

Also, information provided to ESE indicates that in 1981 the engineer supervising oil recovery operations at the site inspected the tank and reported that he observed only dry bricks and rubble, and no oil or sediments [Affidavit of Peter Grajczak, September 7, 1995]. This indicates that the tank was cleaned between 1977 (the EPA inspection) and 1981.

EPA also states that information is not available to demonstrate that the soil is free of PCB residue. However, under the NCP and various EPA guidance documents and policy statements, the soil does not need to be free of PCB residue, only that the concentrations must not present an unacceptable risk. As has been discussed previously, the levels of PCBs documented at the site are not at levels sufficient to present a risk at levels of regulatory concern. Specifically:

1. As stated in Comments 2 and 3, data indicate that the extent of PCBs at the site is limited, and much less than that claimed by the EPA; and

2. ESE's review of the human health and ecological risk assessments indicated that there are no human health risks of regulatory significance associated with PCBs, and PCBs should not even have been selected as a chemical of potential concern for surface water.

Therefore, ESE concludes that there is no requirement or need to investigate and determine if soil surrounding the UST is free of PCBs, because ESE's risk assessment review concluded that PCBs at the site pose no significant threat to public health or the environment and, therefore, remedial actions other than for site control are not appropriate.

COMMENT 8. PCB CONCENTRATIONS IN SOIL IN THE COURTYARD AND SOUTHERN PORTION OF THE SITE (PAGE 5, PARAGRAPH 5).

[CESAR & CHARLENE]

EPA states:

> "Analysis of soil samples show PCB concentrations up to 42 ppm at various depths (in the Southern Portion of the Site) and up to 140 ppm at the surface (in the Courtyard area)."

This statement incorrectly implies that all soil is contaminated with elevated PCB concentrations and that the concentrations range up to 42 ppm. The statement also implies that all surface samples in the courtyard contained PCBs and that the concentrations ranged up to 140 ppm.

However, ESE's evaluation of the information presented in the RI indicates that PCBs are limited in extent in both surface and subsurface soil at the site, especially in the Southern Area, and are not widespread. This was discussed under Comment 2.

Also, PCBs were not detected in 47 of the samples that underwent laboratory analysis as identified in the RI [EARTH TECH 1994a Table 4-10]. Of those reporting PCBs, 57 samples were below 10 ppm and only 14 were above 10 ppm. Therefore, it is more accurate to state that

PCB concentrations ranged from not detected in approximately 40% of samples to over 10 ppm in only 12% of samples. The highest reported value was 42 ppm for PCBs at one location in the Southern Area.

ESE found the same situation regarding the PCBs in the Courtyard soil samples. Contrary to EPA's statement, not all of the courtyard samples contained PCBs. ESE's evaluation indicate that the PCBs are present in small localized areas best characterized as isolated "Hot Spots." The 140 ppm concentration referred to by EPA was at only one location, TB2S, where the duplicate soil sample indicated a level of only 110 ppm. This indicates that the PCB concentrations may not be as high as EPA states.

More importantly, ESE's evaluation of the information and the EPA risk assessments concluded that the PCBs in the Courtyard Soil and in the Southern area were not identified at levels of regulatory significance [ESE 1995a, section 3.2, 3.3, 3.4, 3,5, 3.6, 3.7 and 4.3.5].

ESE's conclusion is that the statements regarding PCB concentrations referred to by EPA are misleading in that they indicate unacceptable concentrations of PCBs over large areas (e.g. in the entire Southern Portion of the Site and Courtyard) and in all samples. ESE has found that PCBs are of limited extent and that the concentrations that are present do not represent a risk of regulatory significance.

COMMENT 9. TPH CONCENTRATIONS IN SOIL (PAGE 5 PARAGRAPH 5).

EPA states: [JAG & CK]

> "Soil samples that appeared to have been stained with oil contained up to 25,000 ppm of **Total Petroleum Hydrocarbons** (TPH)." [Emphasis in original.]

However, ESE's examination of the RI did not identify soil samples with up to that concentration. The highest value of TPH shown in the RI [EARTH TECH 1994a, Table 4-11, page 4-49] is 17,400 ppm. As discussed in Comment 1, this concentration at one location cannot be taken as substantiation of LNAPL conditions when other more definitive indicators of LNAPL are not seen.

The elevated TPH readings that EPA states are present are not substantiated. Elevated TPH readings are not widespread, are lower than as stated by the EPA, and are confined to a small area of the Southern portion of the site.

COMMENT 10. GROUNDWATER SAMPLING RESULTS (PAGE 5 PARAGRAPH 5).

[JAJ, CK, JAJ]

EPA states:

> "Groundwater samples from on-site wells show PCB concentrations as high as 25.6 parts per billion (ppb) in the water phase and 1,000 ppm in oil layer phase (LNAPL)."

The statement made by EPA implies that all groundwater samples contained PCBs, and that concentrations ranged up to 25.6 ppb. ESE's review of the RI and other sources indicates that this statement is incorrect and misleading. ESE further identified information contradicting EPA's position that an oil layer exists at the site.

As shown on Table 4-29, 15 monitor wells were sampled in 1991 and 1992. Of these 15, only two wells (i.e. MW-6, MW-7) contained PCBs above detection levels. Therefore, a more accurate statement would be that PCBs were identified in samples from only two monitoring wells; at up to 25.6 ppb in one well and at 1.3 ppb in another well. This correctly indicates that most of the samples collected do not contain PCBs, even assuming that the reported concentrations represent groundwater, and not an oily sheen (Refer to Comment 1).

ESE identified information indicating that the oil sample obtained in 1991 from MW-6 was of oil that had been introduced into the well during drilling (See Comment 1). Samples from the same well one year later indicated a greatly reduced amount of oil (reported as droplets), and a corresponding order of magnitude decrease in the PCB concentration (i.e. 7 ppb in the oil droplet/water sample). One year later (1993) there was no oil observed in this or any other well [EARTH TECH 1994a, page 2-51]. Therefore, the latest information available for the site establishes that there is no LNAPL layer that can be sampled, and that analysis of oil droplets shows a greatly decreased concentration of PCBs.

In Comment 1, ESE identified information contradicting EPA's assertion of an LNAPL layer existing at the site. This includes information regarding the oil sample reported from MW-6. Furthermore, in Comment 3, ESE identified information contradicting EPA assertions that a floating layer of oil was the mechanism for transporting PCBs from the site. Sufficient information (i.e. from the RI) exists to conclude that LNAPL is not present at the site, and that transportation of PCBs is not occurring.

Therefore, ESE concludes that EPA's statements are not accurate in that they indicate that all groundwater samples contain PCBs. Further, EPA's statement regarding an oil layer is misleading in that the information indicates that LNAPL is not present at the site, and that

the oil sample collected in 1991 was most likely of oil introduced into the well during drilling. As discussed in Comment 1, data obtained during the RI demonstrate that LNAPL conditions do not exist at the site.

COMMENT 11. UPGRADIENT GROUNDWATER QUALITY INFORMATION (PAGE 5 PARAGRAPH 6). [BRUCE, JAY & KEVIN HOSS]

EPA implies that there is no information indicating the quality of groundwater flowing from upgradient. However, the RI contains several references to upgradient water quality.

Figure 3-9 of the RI [EARTH TECH 1994a] shows that groundwater from upgradient enters the site and almost immediately flows past MW-1 and MW-14. As shown by Figures 3-9 and 3-10, this pattern is consistent regardless of the tidal changes. RI Figures 4-20 through 4-25 show that groundwater contamination is highest along the upgradient edge of the property, and outside the UST area. As stated in the RI [EARTH TECH 1994a, page 4-81]:

> "This distribution cannot be attributed to the release of transformer oil from the UST, given the direction of groundwater flow, since the highest concentrations are considerably upgradient of the UST."

The RI [EARTH TECH 1994a, page 5-21] goes on to state:

> "Groundwater data suggest that the VOCs [volatile organic compounds] decrease with distance from the upgradient edge of the site, which may be attributed to a major contribution from off-site upgradient sources followed by natural attenuation, biodegradation/biotransformation and decay processes."

The RI [EARTH TECH 1994a] contains many other references to off-site and upgradient sources of contamination, for example:

- For all groundwater contaminants, Section 2.10.2.2, page 2-50;
- For VOCs, Sections 1.3, page 1-4; 4.4, pages 4-84 & 4-85; 5.5.1, page 5-22;
- For semi-volatile organic compounds (SVOCs), Sections 1.3, page 104; 4.3.1, page 4-56; 4.4, page 4-89; 5.5.2, page 5-23;
- For PCBs, Executive Summary, pages xiii & xv;
- For Metals, Section 4.4, page 4-90; Section 5,5.3, page 5-23; and

- For TPH, Executive Summary pages xiii & xiv; Section 4.3.2 page 4-78; 5.5.4, page 5-24.

The findings of the RI are consistent with information obtained by ERM. ERM [1995, section 1] reviewed aerial photographs and other historical references and identified numerous potential sources of contamination neighboring the Metal Bank site. Two sources, the L. Martin Company Lamp Black Works and the Sun Chemical Corporation - Tacony Plant, were located immediately adjacent to and upgradient from the Metal Bank site. Currently, Hancock Paper and Morris Iron and Steel, a scrap metal operation, conduct operations on the property immediately north of Metal Bank. These and several other potential sources could have contributed to the groundwater contamination which would explain the patterns documented in the RI. ERM [1995] provides additional information regarding upgradient and background sources of contamination in the area surrounding Metal Bank, (for example at sections 1.2, 2.1.5, 2.3.1.1, 2.3.1.3, and 2.3.2.1), demonstrating that the potentially significant contribution from offsite and upgradient sources should be taken into consideration by EPA when formulating remediation decisions.

EPA's Proposed Plan acknowledges that there may be upgradient sources contaminating groundwater by stating:

> "The Site is located in an industrial area of Philadelphia where the upgradient groundwater may also contain elevated levels of contaminants." (Page 5, Paragraph 6).

More importantly, the RI [EARTH TECH 1994a, section 5.5] states:

> "Groundwater flows south and southwest from the site area and discharges to the mud flats and the river, but the existing data suggest little or no potential for future impact to the river, since dissolved components are diluted below significant thresholds upon discharge to the river."

This is consistent with ESE's review of the risk assessment documents prepared by EPA [ESE 1995a, sections 3.6 and 5.4.1], which found that there was no information to support a risk at levels of regulatory concern from direct contact with groundwater or from discharge of groundwater to the river and mudflats.

EPA's statements implying that there is no information upon which to render a decision regarding the quality of groundwater upgradient of the site is not consistent with the numerous conclusions made in the RI. Further, the assessment of risk presented by ESE indicates that data do not support requiring action to address groundwater. Proposing a

multi-million dollar system to treat groundwater that the available data shows, (1) may be contaminated by sources other than the Metal Bank site, and (2) does not pose an unacceptable risk, is not consistent with the goals or intentions of the NCP.

COMMENT 12. SVOCS AND PCBS IN RIVER SEDIMENT AREAS ALONG THE SHORE (PAGE 6, PARAGRAPH 2). [JAY & BRUCE]

EPA states that SVOCs and PCBs are found in sediments, that samples indicate up to 19.6 ppm of PCBs and 17,000 ppm of TPH were found in these sediments, and that their concentration and distribution decrease with distance from the Site.

ERM performed a statistical analysis of the PCB concentrations in the River. ERM concluded that two samples skewed the patterns of the PCB concentrations. In keeping with standard practice, ERM performed a leveraging analysis of the data presented in the Aquatic ERA [NOAA 1994]. Without these two outliers, ERM [1995, section 2.3.1.3] concluded that:

> "PCB concentrations should have been contoured in the sediments. This would have revealed that there was in fact no apparent pattern or gradient relative to distance from the site and thus the Metal Bank site is not the apparent source."

ERM performed other research regarding PCBs in the River [ERM 1995, section 1.2]. ERM concluded that the evidence indicated multiple sources of PCBs in the Delaware River. EPA acknowledges in their PCB Fact Sheet included with the EPA's Proposed Plan (page 7) that there is a Fish Advisory because of PCBs in the Delaware River. Yet, EPA apparently did not take this into account when evaluating the PCB data.

ERM's statistical analysis is consistent with evaluations performed by ESE. If the Metal Bank site were the source of PCBs in the river sediments, then fish samples nearest the site should have higher PCB concentrations. This is not the case. ESE prepared a figure [ESE 1995a, Figure 4-2] that demonstrates that there is no correlation between fish fillets collected in the Delaware River and distance from the site.

ESE also was unable to determine the method used by EPA to arrive at its 1 ppm cleanup goal for PCBs in mudflat sediments. This number apparently is not based on policy. EPA's CERCLA PCB guidance derives interim sediment quality criteria (SQCs) for PCBs normalized to the Total Organic Carbon content (TOC) of the sediment [EPA 1990, Table 3-5]. This issue is discussed further by ERM [1995, section 2.3.1.3]. ERM [1995, section 3.0] found that the FS data

[EARTH TECH 1994a, FS Tables 4-14 to 4-17], when properly evaluated according to the CERCLA guidance, falls within or below the policy range. ERM concluded that this strongly suggested that the PCBs in mudflat sediments could be left in place with no adverse risks to aquatic biota from sediment exposure.

In any event the policy range is subject to site-specific risk evaluation. EPA's Human Health Risk Assessment [ESE 1995a, Table 3-1] for sediments found no unacceptable risks. ESE's recalculation of the aquatic risk values [ESE 1995a] to correct for errors established that the sediments presented no risk of regulatory significance that would require remediation. There also is no indication in the RI/FS document that any attempt was made to quantitatively relate the PCB levels in the mudflat sediments to levels observed in fish, as performed by ESE [ESE 1995a, Figure 4-2]. Finally, there is no supporting information indicating that EPA performed calculations or assessments demonstrating that remediation to the 1 ppm PCB level would result in the desired decrease in PCB levels in fish. This later analysis, normally performed during the FS process, apparently was never done, another example of the errors and inconsistencies in the EPA's Proposed Plan caused by not fully evaluating the proposed remedy as part of the FS process.

Therefore, based on the aroclor patterns as presented in the RI, the data indicate that PCBs in the Delaware River do not originate from the Metal Bank site. ERM [1995, section 2.3.1.1] concludes that the PCB contents of the sediments adjacent to the site are probably not related to previous site activities. Furthermore, EPA has not justified the use of the sediment remediation goal of 1 ppm.

2.2 Comments - Scope and Role of Action

COMMENT 13. REMEDY OBJECTIVES (PAGE 6, PARAGRAPH 3, II SCOPE AND ROLE OF ACTION).

EPA states that its objective for the remedy is to address the principal threat and reduce risk to human health and the environment caused by the Site, consistent with the NCP. As stated by EPA in its baseline Human Health Risk Assessment [EARTH TECH 1994a, Appendix D.1, page 7]:

> "Additionally, the NCP allows EPA to consider action, depending on site-specific factors, where cancer risks are in the range of 1E-06 to 1E-04 (1 in 1 million to 1 in 10,000)."

ESE, in evaluating the baseline risk assessment prepared by EPA, found numerous deficiencies, and concluded:

> "... the revised risk estimates for all exposure scenarios are within the EPA acceptable risk range of 10^{-6} to 10^{-4}...," and "The revised risks indicate that remedial action is NOT warranted at this site." [ESE 1995a, page 1-4.]

ESE evaluated the Aquatic Ecological Risk Assessment and concluded that:

> "In summary, based upon an assessment of the site data and applying EPA guidance, ESE concludes that the site does not represent an aquatic risk and therefore, does not require further remediation." [ESE 1995a, page 4-38.]

Finally, ESE evaluated the Terrestrial Ecological Risk Assessment and concluded that:

> "...the risks identified, and the conclusions reached, are not supported, and are contrary to actual site conditions. Any recommendations regarding remediation at the site can not be based on the Terrestrial RA, as prepared." [ESE 1995a, page 5-2].

Therefore, ESE concludes that conditions demonstrated at the site have not been shown to require remediation consistent with the NCP. ESE's evaluations of the Human Health, Aquatic, and Terrestrial Risk Assessments are detailed in the accompanying report entitled "TECHNICAL REVIEW OF THE HEALTH RISK ASSESSMENT DOCUMENTS: METAL BANK/COTTMAN AVENUE SITE, PHILADELPHIA PENNSYLVANIA, AUGUST 1995. The entire basis for ESE's comments regarding risk are contained in this document which is incorporated herein.

COMMENT 14. REQUIREMENTS OF THE SELECTED REMEDY (PAGE 6, PARAGRAPH 3).

[WAY & COSAR]

EPA lists three requirements of the remedy to be implemented at the Metal Bank site. First, EPA states that to achieve the site objective, the selected remedy must remove and dispose of contaminants from the Site, the Delaware River or other environments, which cause an unacceptable risk to human health, terrestrial or aquatic life. As mentioned in Comment 13, ESE found that there were no risks of regulatory significance at the site. Therefore, the removal and disposal of sediments is not required.

Moreover, a removal action performed in the river and mudflats may cause greater risks than that deemed to exist. ERM points out the significant impacts of the dredging operation [ERM 1995, section 2.3.1.5 and 2.3.1.6] proposed by EPA. The installation of the sheet pile wall, the movement of heavy equipment, and the dredging of sediments would cause an increase in fluxes of PCBs and other contaminants to the river or other media, despite the use of control technologies. As pointed out by ERM [ERM 1995, section 2.3.1.5],

> "The magnitudes of these releases, the fates of the materials released, or the risks associated with these materials, were never estimated, even in a qualitative manner, as required by the National Contingency Plan."

And,

> "There likely would be short-term increases in mobile PCBs, and thus risks, due to the dredging. In the long term, sediments contaminated with PCBs would be transported in from other areas and redeposited in the newly dredged area, resulting in no long-term benefit whatsoever."

ESE also pointed out the difficulties with implementing sheet piling [ESE, 1995b, section 2.3.3] and sediment removal [ESE 1995b, section 2.3.7]. ESE and ERM both concluded that any remedial measures implemented to address sediments would be ineffective, since the measures do not and cannot address the probable redeposition of PCBs and sediments from off-site sources.

Second, EPA states that the selected remedy must provide containment and long-term monitoring of Site contaminants which would cause an unacceptable risk to human health, terrestrial, or aquatic life, if they should continue to be released into the Delaware River or other environment. As discussed in Comments 1 (LNAPL), 2 (PCB "Hot Spots"), 3 (Metal Bank Oil Layer), 4 (DNAPL), 6, (Tidal Fluctuations), 7 (UST and PCB Residues), 10, Groundwater Results), and 12 (PCBs and Semi-volatile organic compounds or SVOCs in Sediments), the available data demonstrates that contaminants are not being released into the Delaware River at levels that would cause an unacceptable risk, and there is no valid reason requiring additional containment of contaminants that do not appear to be moving.

Finally, EPA states that the selected remedy must mitigate unavoidable impacts to wetlands or waters of the U.S. caused by implementing the Site remedy. ESE's review of the remedy reveals that sediment removal would be technically and administratively difficult to implement, and would likely cause more short-term risk to human health and the environment than they would reduce any long term risk [ESE 1995b, section 2.3.7].

ESE [1995a, section 1.4.2 and 1.4.3] also concluded that there were no terrestrial or aquatic risks that required remediation. Therefore, there is no justification for implementing sediment remediation program that would possibly increase short term risks.

EPA's statements regarding the remedial objective is not entirely consistent with the remedial objectives as stated in the FS. Section 2.2.2 of the FS [EARTH TECH 1995] indicates that the southern area subsurface soil and groundwater were not carried through as media of concern at the site; however, major programs are proposed by EPA to address these areas. At no point in the EPA's Proposed Plan does EPA explicitly state the remedial objectives they developed that allowed them to propose Alternative C-7A over other alternatives. This is inconsistent with the RI/FS process as developed by EPA, and is inconsistent with the NCP.

ESE used the FS objectives as stated, and performed its own alternatives evaluation. ESE developed two alternatives that meet the FS stated remedial objectives [ESE 1995b], at far lower costs than that proposed by the EPA.

ESE concludes that the requirements identified for the remedy are based on a faulty premise that the site is posing an unacceptable risk to human health and the environment. Because the premise upon which they are based is in error, the remedy requirements are also in error. EPA has not clearly stated it's remedial objectives for the site that are met by Alternative C-7A. These objectives must be based on the RI and Baseline RA. Alternatives such as C-7A then can be properly evaluated as to their ability to meet the stated objectives.

COMMENT 15. PCBS ARE THE MAJOR CONTAMINANTS OF CONCERN THAT ARE CAUSING UNACCEPTABLE RISKS TO HUMAN HEALTH, TERRESTRIAL AND AQUATIC LIFE (PAGE 6, PARAGRAPH 4).

[JAY, BOB & ROY]

As discussed under Comment 12, several information sources have been used to conclude that there is no clear evidence demonstrating that the PCBs found in Delaware River and mudflat sediments are related to the Metal Bank site. More importantly, ESE concluded that PCBs have not been shown to present a risk of regulatory significance at the site.

As discussed in previous comments, ESE concluded that the PCB concentrations found at the Metal Bank site during the RI did not pose a risk of regulatory concern to human health, and/or aquatic or terrestrial life. Therefore, EPA has proposed a remedy that addresses a contaminant that has not been shown to present a risk that requires remediation. This position is supported by the document entitled "TECHNICAL REVIEW OF THE HEALTH

RISK ASSESSMENT DOCUMENTS: METAL BANK/COTTMAN AVENUE SITE, PHILADELPHIA PENNSYLVANIA, AUGUST 1995" [ESE 1995a]. This document provides the expanded basis for ESE's comment.

COMMENT 16. THE REMEDIATION OBJECTIVE REQUIRES ADDRESSING PCBS AS THE PRINCIPAL THREAT AND RISK TO HUMAN HEALTH AND THE ENVIRONMENT (PAGE 6, PARAGRAPH 4).

[Roy]

As discussed in Comment 15, ESE concluded that PCBs at the Metal Bank site do not pose a risk of regulatory concern to human health, and/or aquatic or terrestrial life. This position is supported by ESE 1995a, which is incorporated herein. EPA's remediation objective requires addressing contaminants that have not been shown to present a risk at levels of regulatory concern. The remedy proposed to meet this objective is not justified by the existing site conditions.

ESE concludes that the remediation objective that requires addressing PCBs is not supported by the information reviewed by ESE. ESE's risk assessment review concludes that the site poses no significant threat to public health or the environment and, therefore, remedial action other than site control is not appropriate.

2.3 Comments - Summary of Site Risks

COMMENT 17. PCB FACT SHEET (PAGE 7). [Roy & Cesar]

EPA presented a fact sheet on PCBs in its Proposed Plan. ERM prepared a primer on PCBs and discussed PCBs in the aquatic environment [ERM 1995, section 1.4 and 1.5] that contradicts several EPA statements. For example, ERM found that there is growing evidence that PCBs are undergoing natural degradation in the environment. ERM also raised concerns about EPA's grouping of all PCBs together. EPA states that,

> "Laboratory data show that PCBs cause cancer in animals."

However, ERM pointed out that the toxicity of the PCBs varies widely depending on which of the over 200 congeners that are being discussed. This position also is supported by information provided in the EPA CERCLA guidance on PCBs [EPA 1990, section 8.4]. ERM raises other issues about EPA's handling of PCBs, and their report should be reviewed.

In addition, information is presented that is not relevant to the Metal Bank site. For example, EPA includes statements regarding the formation of dioxin when PCBs are burned; however, there is no information available to ESE indicating that burning took place at the site. Similarly, EPA mentions a fish advisory in the Delaware River because of PCBs, which can be taken as a result of the Metal Bank site. However, several sources [ERM 1995, sections 1.2, 1.3, 1.4, 2.1.4, and 2.3.1.3] have determined that PCBs are present from multiple sources. The fish advisory has been established and issued by the Pennsylvania Fish and Boat Commission for PCBs in channel catfish, white perch, and the american eel inhabiting the Delaware River between Yardley and the Delaware/Pennsylvania state line [ESE 1995a, section 3.10.]. Yardley is 30 miles upriver from the Metal Bank site.

Information in EPA's "fact" sheet is presented in such a way that the general public is led to conclude (improperly) that many of the concerns associated with PCBs in general are specifically related to the Metal Bank site, which is not the case based on the available information. (see Comments 2, 3, 8, and 12.)

Therefore, ESE concludes that the EPA Fact Sheet regarding PCBs does not clearly indicate several important qualifying facts that would allow conditions existing at the Metal Bank to be appropriately understood. EPA's Fact Sheet provides information in a manner that can mislead the public and hinder an understanding of EPA's rationale for the Proposed Plan. As presented, the Fact Sheet suggests support for EPA's rationale for remedial action, which is not supported by site-specific data and evaluations.

COMMENT 18. HUMAN HEALTH RISK ASSESSMENT (PAGE 7, SECTION III.A).

[Roy]

EPA states that,

"...risk levels between $1x10^{-4}$ and $1x10^{-6}$ may also prompt EPA to take remedial action."

This is not as accurate as the statement contained in the NCP. The NCP states,

> "(2) For known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess upper bound lifetime cancer risk to an individual of between 10^{-4} and 10^{-6} using information on the relationship between dose and response." [40 CFR 300.430(e)(2)(i)(A)(2).]

The inconsistency is that the EPA's Proposed Plan states that action may be required, but the NCP says that the levels are generally acceptable.

The statements in the EPA's Proposed Plan also are not completely consistent with other EPA guidance documents. The EPA risk assessment guidance, "The Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions" states that where the cumulative site risk to an individual based on reasonable maximum exposure for both current and future land use is less than 1E-04, and the non-carcinogenic hazard quotient is less than 1, action generally is not warranted unless there are adverse environmental impacts. [ESE 1995a, section 1.4.1]. Again, this statement from EPA guidance is not consistent with EPA's statement regarding the risk levels that trigger action.

The initial statement made by EPA in its discussion of the Human Health Risk Assessment again illustrates the internal inconsistencies ESE has identified in the EPA's Proposed Plan. EPA states on page 8,

> "OFF-SITE RESIDENTS: Cancer risk associated with inhalation of Site dust was estimated to be $2x10^{-6}$. The Hazard Quotient could not be calculated since none of the contaminants had inhalation reference doses. Therefore, the Site does not pose an unacceptable risk to **Off-Site Residents.**" [Emphasis in original]

However, EPA later appears to contradict this statement on page 16,

> "With respect to the Human Health Risks, EPA recognizes that there is a day care center (St. Vincent's School) adjacent to the Site, which also serves as permanent residence to approximately 84 orphans."

EPA's initial statement regarding no risk is consistent with their own baseline risk assessment [EARTH TECH 1994a]. This also is consistent with the findings of samples collected at the orphanage in 1987 and 1989 [VERSAR 1988, and EPA 1989]. This is another example of internal inconsistencies in the EPA's Proposed Plan.

ESE concludes that if EPA properly calculated risk levels as performed by ESE, the risks to human health would be well within the range which the NCP considers as acceptable exposure levels, and no further remediation would be required at the site.

COMMENT 19. RECREATIONAL FISHERMEN/BOATERS (PAGE 8, ITEM 2).

[Roy]

EPA states that the PCBs in the nearby sediment, especially in the Riprap Area, appear to be site-related, and therefore that there is an unacceptable risk to recreational fishermen (i.e. boaters) who eat 10 meals a year of fish caught near the site. ESE has identified several inaccuracies in this statement. First, because of the habitat, it is very unlikely that fish will come into contact with the riprap. Second, ESE's evaluation of the EPA Health Risk Assessment indicated that the concentrations in fish that EPA states are the cause for requiring remedial action at the site are below the allowable tolerances established by the U.S. Food and Drug Administration (FDA) for PCBS in fish fillets and shellfish (edible portion). This means that the fish EPA calculated as posing a risk could be sold in supermarkets and would meet FDA guidelines. This issue is discussed at length in Section 3.8 (river sediments), 3.9 (rip rap), and 3.10 (fish) of ESE's evaluation of the EPA risk assessment documents [ESE 1995a].

In addition, there is already a fish advisory in the Delaware River, which indicates that certain fish should not be eaten if caught. The fish advisory has been established and issued by the Pennsylvania Fish and Boat Commission for PCBs in channel catfish, white perch, and the american eel inhabiting the Delaware River between Yardley and the Delaware/Pennsylvania state line [ERM 1995, section 1.2]. Yardley is 30 miles upriver from the Metal Bank site. Therefore, EPA is identifying a risk to fisherman who eat 10 meals a year of fish caught in an area where a well known fish advisory recommends not eating the fish.

ESE concludes that, based on EPA risk assessment guidance, riprap sediments do not warrant remedial action as the cumulative risks are significantly lower than $1x10^{-4}$, the non-carcinogenic hazard quotient is less than 1, and no adverse environmental impacts exist [ESE 1995a, page 3-67].

COMMENT 20. FUTURE INDUSTRIAL WORKERS (PAGE 8, ITEM 3).

[Roy]

EPA states that their calculated risk to future industrial workers is $7x10^{-5}$, attributed primarily to chance ingestion of PCBs in courtyard soil. EPA further states that therefore the courtyard soil pose an unacceptable risk. ESE identified several concerns associated with this position. As

mentioned in Comment 18, the NCP holds that concentrations on the order of 10^{-5} are generally acceptable. EPA guidance further states that risks less than 10^{-4} generally do not require action unless there are adverse environmental impacts [ESE 1995a, section 1.4.1]. However, the EPA's Proposed Plan does not list any special considerations or adverse environmental impacts that are causing EPA to propose action to address a risk level the NCP and other EPA guidance says is generally acceptable.

ESE reviewed EPA's procedures and identified four major deficiencies resulting in an overstated risk [ESE 1995a, section 3.2 and 3.3]. ESE recalculated the risks and determined that the risks remain within the 10^{-5} range. ESE also did not find adverse environmental impacts based on the data presented in the RI. This is discussed in ESE's report on the risk assessments [ESE 1995a, section 3.11].

No risk scenario has been shown to require remedial action based on the risks associated with future industrial workers exposed to courtyard soil. ESE concludes that neither the EPA's Proposed Plan nor the RI/FS provide sufficient information regarding potential adverse impacts that support EPA's deviation from the NCP and its own guidance. ESE's risk assessment review concludes that the site poses no significant threat to public health or the environment and, therefore, remedial action other than site control is not appropriate.

COMMENT 21. FUTURE CONSTRUCTION WORKERS (PAGE 8, ITEM 4). [Rog]

EPA states that there is an unacceptable risk posed to future construction workers exposed to PCB oils floating on groundwater, and also to polynuclear aromatic hydrocarbons (PAHs), dioxin and furans contained in these oils. However, EPA states that the contaminant risk is minor for the compounds other than PCBs.

ESE has commented previously (Comments 1 and 3) that the available information indicated that PCB-containing oils are not floating on the groundwater. Without LNAPL, there is no risk to workers. Further, EPA assumes that the construction workers would be cleanup contractors working without protective precautions in place. Regulations require protective precautions for cleanup contractors at Superfund sites [29 CFR 1910.1120]; therefore, EPA is postulating a scenario that would not be allowed by regulation. It is difficult to believe that EPA would allow remediation contractors to work at a Superfund site without the health and safety protection required by the Occupational Safety and Health Administration (OSHA) regulations.

If EPA would allow unprotected workers to implement remedial actions at this or any NPL site, using a remedial action scenario to justify that same remediation scenario is not logical. The proposed remediation would in this case cause the very exposure that it is designed to prevent.

ESE recalculated the exposure and associated risks, based on the most current groundwater concentration data, as presented in the RI, as below $1x10^{-6}$. Therefore, remedial action is not warranted. This is discussed in detail in Section 3.7 of ESE's evaluation of the EPA Risk Assessments [ESE 1995a].

ESE concludes that EPA has proposed an exposure scenario that is not valid because it requires violating Occupational Safety and Health Administration (OSHA) regulations. ESE also found that the available data demonstrate that LNAPL conditions are not present at the site. Finally, ESE's calculations using the most recent groundwater samples indicate that there is no risk, based on reasonable exposure scenarios, that warrants remedial action.

COMMENT 22. TERRESTRIAL ECOLOGICAL RISK ASSESSMENT (PAGE 9, SECTION III.B). [BOB]

EPA states that its Terrestrial Risk Assessment evaluated risks to land animals such as muskrats, ducks, and birds as well as the organisms they feed on. ESE reviewed the EPA Terrestrial Risk Assessment and concluded that the Terrestrial Risk Assessment as prepared by EPA, is fatally flawed [ESE 1995a, section 5.1]. The EPA Terrestrial RA did not conform with Agency guidance, focused incorrectly on aquatic organisms, was inconsistent with the EPA Aquatic Risk Assessment, and contained fundamental errors at every step of the risk assessment process [ESE 1995a, section 5.1].

ESE concludes that based upon a reasonable degree of scientific certainty, the risks identified and the conclusions reached in EPA's Terrestrial Risk Assessment, are not supported and are contrary to actual site conditions. None of the recommendations regarding remediation at the site can be based on the Terrestrial RA, as prepared by EPA.

COMMENT 23. PRINCIPAL RESULTS OF THE TERRESTRIAL RISK ASSESSMENT - GROUNDWATER (PAGE 9, ITEM 1). [BOB]

EPA concludes that all contaminants, except PCBs, will not pose a threat to aquatic organisms in the Delaware River. ESE evaluated the Aquatic RA, specifically as it treated PCBs, and

concluded that risks from PCBs in surface water were based on an excessively conservative evaluation for the Shortnose Sturgeon [ESE 1995a, section 4.3.3]. ESE further concluded that there is no demonstrated risk from PCBs, and that PCBs and the groundwater pathway were not a completed pathway for terrestrial species [ESE 1995a, section 5.3.3].

This position is supported by analysis performed by ERM [1995, section 2.3.1.3]. ERM concluded that correct calculations of PCB concentrations in the water column would be in the part per trillion range, and that this would be much lower than that estimated in the Aquatic RA [NOAA 1994].

ESE concludes that based upon a reasonable degree of scientific certainty, the risks identified and the conclusions reached in EPA's Terrestrial Risk Assessment, are not supported and are contrary to actual site conditions. None of the recommendations regarding remediation at the site can be based on the Terrestrial RA, as prepared by EPA.

COMMENT 24. UNCONTROLLED PCB SEEPS (PAGE 9, ITEM 1). [JAY & CESAR]

EPA states that the installation of subsurface trenches and oil-water separators would eliminate all uncontrolled seeps into the river. As has been stated in Comments 1, 2, and 3, ESE has identified several items that contradict EPA's position regarding contamination in groundwater or an LNAPL layer leaving the site. As stated on page 4-105 of the RI,

> "No 'oil seeps' (i.e. seepage of pure product) were identified during any of the field work in 1991, 1992, or 1993. It is thus concluded that the concentrations of PCBs (25 ppb) identified in monitoring wells at the southwest corner of the site in 1992, and in the groundwater seeps, suggest that PCBs are not exiting the site via seeps in significant concentrations."

Therefore, ESE concludes that the available information does not support implementation of an "oil seep" control system since there is no oil to seep. Groundwater seeps have been sampled at the site and only one of these contained detectable concentrations of PCBs (3.7 ppb, assuming that the sample was not cross-contaminated by sediment). Mixing in the river will dilute this concentration to minute levels. Risks to terrestrial species have not been demonstrated. In fact the EPA's proposed remedy will allow groundwater to continue to discharge to the River as special holes will be installed through the sheet pile for this purpose.

COMMENT 25. PRINCIPAL RESULTS OF THE TERRESTRIAL RISK ASSESSMENT - MUDFLATS (PAGE 9, ITEM 4). [BOB]

EPA states that there was a calculated impact from PCBs and DDT-type pesticides projected to result in a loss of small organisms living in the river bottom. ESE found that the use of aquatic organisms in a terrestrial risk assessment was inappropriate and contrary to EPA guidance [ESE 1995a, section 5.3]. ESE [1995a, Figure 4-1] also identified that the RI found abundant organisms living in the mudflats, which contradicts the EPA position regarding the toxicity of the mudflat to small organisms.

This conclusion is consistent with that reached by ERM [ERM 1995 section 2.3.2 and 2.3.2.1]. ERM concluded that the EPA Terrestrial RA improperly concludes that remediation of the sediment is needed. ERM also pointed out the remediation of the mudflats involves excavation that will eliminate all the organisms currently living in the mudflat area to be remediated. This destructive action by EPA would be injurious to the River environment and is not justified by the site or River conditions.

ESE concludes that the EPA Terrestrial RA incorrectly indicates that remediation of the mudflats is required. ESE concludes that remediation will destroy the organisms that EPA is trying to protect. Based on the available information, remediation of the mudflats does not appear appropriate because there is no significant threat to public health or the environment.

COMMENT 26. PRINCIPAL RESULTS OF THE TERRESTRIAL RISK ASSESSMENT - RIP RAP (PAGE 9, BOTTOM). [BOB]

EPA maintains that its Terrestrial RA indicated a significant risk from exposures in the riprap area. ESE's review of the EPA Terrestrial RA concluded that it did not conform with Agency guidance, focused incorrectly on aquatic organisms, was inconsistent with the EPA Aquatic Risk Assessment, and contained fundamental errors at every step of the risk assessment process [ESE 1995a, section 5].

ESE concludes that based upon a reasonable degree of scientific certainty, the risks identified and the conclusions reached in EPA's Terrestrial Risk Assessment, are not supported and are contrary to actual site conditions. None of the recommendations regarding remediation at the site can be based on the Terrestrial RA, as prepared by EPA.

COMMENT 27. AQUATIC RISK ASSESSMENT - FISH AND OTHER AQUATIC ORGANISMS (III.C., PAGE 10 ITEM 1). [JAY]

EPA states that the primary concern during the Aquatic RA was the Shortnose Sturgeon. EPA further states that the Shortnose Sturgeon spends its entire life cycle in the Delaware River. While this statement is correct in a broad sense, ESE believes that it is misleading in that it implies that the Sturgeon is in the vicinity of the Metal Bank site during its entire life cycle. Further, ESE reviewed the Aquatic RA and determined that EPA's evaluation of the Sturgeon was highly conservative, inappropriate, highly biased and technically improper. ESE identified several deficiencies including that the Sturgeon has not been identified near the site, that habitat to draw the Sturgeon near the site is unavailable, and that the toxicity data used for the Sturgeon related to reproductive effects even though the spawning grounds are at least 49 km from the Metal Bank site [ESE 1995a section 4.3.3].

ERM also found that significant exposure to the Sturgeon was unlikely [ERM 1995, section 2.3.1.4].

ESE concludes that, based upon its assessment of the site data and by applying EPA guidance, the site does not represent an aquatic risk and therefore does not require further remediation to address a risk to aquatic species.

COMMENT 28. AQUATIC RISK ASSESSMENT - CONTAMINANTS OF CONCERN (PAGE 10, ITEM 2). [JAY]

EPA states that PCBs are the primary contaminant of concern, and that impacts of other contaminants including PAHs and phthalates were evaluated for the Aquatic Risk Assessment. ESE's evaluation of EPA's Aquatic Risk Assessment indicated that PCBs should not have been identified as contaminants of concern at the site. Further, ESE also found that the other contaminants of concern identified by EPA have not been shown to originate from the Metal Bank site [ESE 1995a, sections 1.4.2, and 4.3].

ESE concludes that, based upon its assessment of the site data and by applying EPA guidance, PCBs should not have been identified as a contaminant of concern, and that the other chemicals of concern identified by the EPA do not represent an aquatic risk. Therefore, the site does not require further remediation to address a risk to aquatic species.

COMMENT 29. AQUATIC RISK ASSESSMENT - EXPOSURE PATHWAYS (PAGE 10, ITEM 3). [JAS]

EPA maintains that it evaluated potential routes of exposure. EPA further states that a clear pattern of decreasing contamination with distance from the site boundary was found. ESE's evaluation of the available data contradicts these conclusions. ESE found that exposure to LNAPL was not a completed pathway [ESE 1995a, sections 1.4.2 and 4.3.4]. ESE further found that there was no clear pattern of decreasing concentration with distance from the site [ESE 1995a, section 4.3.5]. This conclusion is supported by ERM's analysis of the sediment information [ERM 1995, sections 2.1.4, 2.1.5, 2.3.1.3]. This has been discussed by ESE under Comment 3.

ESE concludes that, based upon its assessment of the site data and by applying EPA guidance, there is not a completed exposure pathway for PCBs in LNAPL, and that there was no pattern of contaminants in the sediments. Therefore, the site does not require further remediation to address any risk to aquatic species.

COMMENT 30. AQUATIC RISK ASSESSMENT - TOXICITY (PAGE 10, ITEM 4). [JAS]

EPA states that no site-specific testing or biological effects assessments had been performed, and therefore only published values for toxicity were used. ESE evaluated the available information and identified several items that contradict this statement. For example, sediment toxicity studies [ESE 1995a, section 4.3.5.6] were performed for sites upstream and downstream of the site. These showed that sites upstream of the Metal Bank site were more toxic than downstream of Metal Bank. Also, RI data showed that there were large populations of organisms living in close proximity to the site, opposite to that expected if the Metal Bank site were having an impact on aquatic species. Finally, ESE found that EPA used incorrect and inappropriate toxicity benchmarks. For example, toxicity studies related to marine organisms were used to calculate the impact on freshwater species [ESE 1995a, section 4.4].

ESE concludes that, based upon its assessment of the site data and by applying EPA guidance, risk estimations would more closely resemble actual risks to aquatic receptors if appropriate toxicity benchmarks were used and other errors were corrected. ESE concluded that in all cases, EPA projected "impacts" would be reduced or eliminated following such revisions. Therefore, the site does not require further remediation to address any risk to aquatic species.

COMMENT 31. RISK CHARACTERIZATION - SURFACE WATER AND GROUNDWATER (PAGE 10, BOTTOM, ITEM 1 AND PAGE 11).

[JAY]

EPA states that only PCBs were identified as a contaminant of concern in surface water. Comment 3 demonstrates that PCBs should not have been identified as a contaminant of concern at all if EPA guidelines were correctly applied to the site. Further, EPA states that the calculated hazard quotient was greater than one for the Shortnose Sturgeon; however, ESE's calculations demonstrate that the Ecological Quotient was significantly below 1 for this species [ESE 1995a, section 4.5].

EPA also states that the continued discharge of PCBs into the Delaware River with groundwater will contribute to PCBs in the near shore food webs. This statement is unsubstantiated by the EPA Aquatic Risk Assessment. EPA has not performed any calculations indicating that there is an unacceptable risk to near shore food webs. Calculations performed by both ESE [ESE 1995a, section 4.5] and ERM [ERM 1995, Appendix F] showed that any discharge of PCBs in groundwater from the site at the levels found during the RI would be significantly below the Ambient Water Quality Criteria for PCBs.

ESE concludes that the site does not require further remediation to address a risk to aquatic species because groundwater discharges to the river did not exceed Ambient Water Quality Criteria once mixing within the river was included in calculations.

COMMENT 32. RISK CHARACTERIZATION - NON-AQUEOUS PHASE LIQUID (NAPL) (PAGE 11, ITEM 2).

[JAY]

EPA states that there would be an unacceptable aquatic risk due to PCBs, PAHs, and phthalates in the NAPL area. ESE evaluated the available information and concluded that there was not a completed pathway for NAPL at the site [ESE 1995a, section 4.3.4]. This is also discussed under Comment 2.

ESE concludes that there is no risk from NAPL because the pathway for an exposure to NAPL was not completed.

COMMENT 33. RISK CHARACTERIZATION - MUDFLAT AND RIPRAP AREAS (PAGE 11, ITEM 3). [JAY]

EPA states that an unacceptable aquatic risk exists in the sediments associated with the riprap due to PCBs and PAHs, and the degree of risk declines with distance from the riprap area into the mudflat. Based on the available information, ESE concluded that there are no unacceptable risks to aquatic species. ESE found that the chemicals of concern have not been established to have a source at and a gradient away from the Metal Bank site [ESE 1995a, section 4.1]. ESE also found that there were no adverse impacts shown on the aquatic organisms either in species abundance or increased body burdens [ESE 1995a, section 4.3.1 and 4.3.5.6].

ESE concludes that based upon an assessment of the site data and applying EPA guidance, the site does not represent an aquatic risk, and therefore does not require further remediation.

COMMENT 34. RISK CHARACTERIZATION - DELAWARE RIVER SEDIMENT AREA (PAGE 11, ITEM 4). [JAY]

EPA states that not enough information is available to determine if PCB concentrations and other contaminants of concern in sediments in the Delaware River adjacent to the site represent an unacceptable degree of risk to aquatic organisms. However, as pointed out previously, ERM identified information to show that PCBs are present throughout the Delaware River [ERM 1995, section 1.2 and 2.3.1.3]. ESE also found that there was no difference between fish samples collected near the site and at other locations throughout the Delaware River [ESE 1995a, section 4.3.5.6]. ESE found that there was a large amount of information that could be evaluated, and that it showed the historically ubiquitous nature of PCBs in the fillets of channel catfish over a 200 mile length of the Delaware River.

Based on the available information, ESE concludes that there is not a pattern of PCB and other contaminants in sediments in the immediate vicinity of the site which are site related, and the site does not represent an aquatic risk. Therefore, remediation is not required.

COMMENT 35. RISK CHARACTERIZATION - THE SHORTNOSE STURGEON (PAGE 11, ITEM 5). [JAY]

EPA states that the Shortnose Sturgeon may be particularly prone to accumulating and transferring high concentrations of PCBs to their developing offspring. EPA suggests (page 17, paragraph 5)

that there is an unacceptable risk to the Shortnose Sturgeon. ESE evaluated the available information and concluded that there was not an unacceptable risk posed to the Shortnose Sturgeon to PCBs at the Metal Bank site [ESE 1995a, sections 4.3.3 and 4.5]. This is consistent with ERM's evaluation of the Shortnose Sturgeon [ERM 1995, sections 2.3.1.1 and 2.3.1.4].

ESE concludes that a calculation using conservative and protective assumptions supported by the life-history data for the species contradicts the EPA conclusion that there is a risk posed to the Shortnosed Sturgeon due to exposure to PCBs at this site.

2.4 Comments - Summary of Alternatives

COMMENT 36. REMEDIAL ACTION OBJECTIVES (SUMMARY OF ALTERNATIVES, PAGE 12). [CESAR & BETSY]

As described in ESE's Engineering Evaluation [ESE 1995b, section 1.3.1] RAOs should form the basis for alternative development in the feasibility study. As per EPA guidance [EPA 1988, section 4.2.1], these RAOs identify the media of concern, the contaminants of concern, the potential exposure routes, and a preliminary remediation goal (i.e. clean up level).

ESE evaluated the EARTH TECH FS, conducted an engineering evaluation of potential remedial alternatives which would be consistent with the findings of the RI and with the FS RAOs, and developed two alternatives that met the RAOs. ESE concluded [ESE 1995b, section 1.2],

- The RAOs developed in the FS are inappropriate and unclear;
- The FS did not logically apply the RAOs during the evaluation of alternatives;
- The FS did not adequately consider the significant remedial actions already taken at the site;
- The FS did not objectively consider the technical implementability or effectiveness of the remedial alternatives developed in the FS;
- January 1995 sampling information provides support for concluding that the sediments are not impacted by the site;
- Because of the presence of River-borne PCBs, any remedial activities undertaken in the mudflats and River sediment area near the site will likely be undermined by recontamination;

- Remedial measures, in particular those within the mudflat and River adjacent to the site, beyond limited action, are not necessary to comply with the requirements of the NCP.

ESE determined that a properly completed FS, based on an accurate and appropriate Baseline RA, would have identified a limited action alternative as appropriate to address site conditions as documented by the RI, and evaluated by the Baseline RA. ESE developed such a limited alternative as part of its engineering evaluation of the FS [ESE 1995b, section 3.2.2].

Even though ESE found that the FS establishes a set of RAOs which are inconsistent with the findings of the RI, are driven by inaccurate risk assessments, are erroneously derived, and are poorly applied, ESE was able to develop a second alternative which is consistent with the FS RAOs, is implementable, and is calculated to cost less than any of the alternatives identified in the FS, and than proposed alternative C-7A [ESE 1995b, section 3.2.3].

In the EPA's Proposed Plan, the RAOs developed in the FS are not discussed, and these RAOs are largely ignored in EPA's development and evaluation of proposed alternative, C-7A. For example, C-7A includes significant efforts to address the groundwater even though the FS does not include an RAO for groundwater, finding that it is not a media of concern [EARTH TECH 1994a, FS section 2.2.2].

Alternative C-7A is designed to address media and exposure pathways not identified in the FS. However, the RAOs for Alternative C7-A are not described in the EPA's Proposed Plan. In addition to being inconsistent with EPA guidance [EPA 1988, section 4.2.1], the absence of clearly stated RAOs for alternative C-7A apparently is a factor in EPA's proposing a remedy that is internally inconsistent, and does not address the calculated risks posed by documented site conditions. These inconsistencies are a major concern with regard to the need for the proposed remedy, the ultimate costs, the effectiveness that will be achieved, and the benefits resulting from implementation.

Neither the subsurface component nor Alternative C-7A taken as a whole has undergone the thorough evaluation process as required during the FS process, as was performed on the other alternatives. The inconsistencies obvious throughout Section IV and V are likely a result of EPA not having subjected alternative C-7A to the same level of detailed evaluation as the other alternatives.

The FS prepared by EARTH TECH did not develop appropriate RAOs for the site. This led to the development and evaluation of alternatives that are not consistent with the site conditions as documented in the RI. ESE evaluated the FS and identified an alternative that can meet the FS objectives but at a lower overall cost.

The EPA's Proposed Plan ignores the RAOs developed by the FS, and does not state the media specific RAOs for the proposed alternative, C-7A. Alternative C-7A contains components that address media (groundwater and southern area subsurface soil) identified in the FS as not requiring remedial action. EPA also has not documented that an in-depth evaluation as normally completed during the FS has been performed on Alternative C-7A. The result is that EPA is proposing a remedy that is internally inconsistent, was developed in a manner not consistent with EPA's own guidance, and addresses media and risks that are not a concern based on the available information.

ESE evaluated the RI, FS, and Baseline RA, and developed two alternatives that address site risks as required by the NCP but at a significantly lower cost than that of the proposed remedy. ESE's evaluation is provided in the document entitled "TECHNICAL EVALUATION OF REMEDIAL ALTERNATIVES FOR THE METAL BANK/COTTMAN AVENUE SITE, ENVIRONMENTAL SCIENCE & ENGINEERING, INC., SEPTEMBER 1995. This document provides the entire basis for ESE's comment, and is incorporated herein.

COMMENT 37. AREAS IDENTIFIED AS REQUIRING REMEDIAL ACTION (PAGE 12, ITEMS 1 THROUGH 5). [CESAR]

EPA states:

> "Each alternative [in the FS] specifies remedial actions to be taken with respect to the following areas at the Site...",

and includes, in the listing that follows, the Building Area, "Hot Spots" (i.e. subsurface soils), and Groundwater. The FS did not include alternatives that addressed the Building Area or Groundwater, because these were not identified as media of concern in the RAOs. In addition, the FS did not include measures to address subsurface soil "Hot Spots" in the southern portion of the site, except with regard to removal of the tank and any associated PCB-contaminated soil in excess of 50 ppm and as a potential measure to prevent LNAPL migration, since subsurface soil was not identified as a medium of concern in the FS RAOs.

EPA provides no basis for contradicting the FS and including in the proposed remedy components to address the building and groundwater as media of concern. As discussed in many of the previous comments (e.g. Comments 1, 2, 3, 4, 6, 7, 8, etc) including these areas is not consistent with the information provided in the RI, and is not based on a correct calculation of the risks posed [ESE 1995a].

EPA is proposing a remedy that addresses media that have not been identified as requiring remediation either during the FS, or in ESE's recalculations of site risks [ESE 1995a]. EPA has not documented the basis for requiring these components by stating and supporting a remedial action objective as called for by EPA guidance [EPA 1988, section 4.2.1]. The alternatives evaluated during the FS are not comparable to Alternative C-7A because the FS alternatives did not include measures to address the building or groundwater as they were not identified as being of concern.

COMMENT 38. CLEANUP LEVELS AS SPECIFIED ON TABLE 1 (PAGE 12).

[CESAR & ROY]

Table 1 of the EPA's Proposed Plan identifies risks EPA maintains are posed by the site. First, as has been stated (refer to comment 2 and ESE 1995a, section 1.4.1) the NCP [40 CFR 300, 430:62] indicates that acceptable exposure levels are those calculated as presenting an excess cancer risk of 10^{-4} to 10^{-6}. EPA guidance also specifies that if cumulative risk is less that 10^{-4}, action is generally not warranted unless a chemical specific, risk, based standard is violated [ESE 1995a, section 1.4.1]. Based on this and not correcting Table 1 for the deficiencies mentioned by ESE previously, no action is warranted to address the Courtyard. EPA does not describe its justification for requiring remediation of this area.

More importantly, ESE has identified numerous errors and deficiencies in the baseline risk assessment performed by EPA, NOAA and their support contractors, and concluded that the site did not pose a risk that was greater than the acceptable range of 10^{-4} to 10^{-6} (refer to Comment 2, and Comments 13 through 35, and ESE 1995a).

Table 1 also inappropriately specifies clean up levels for media that are not identified in the RAOs, and specifies levels which are based not on site-specific risk values, but are based on apparently inappropriate application of policies and guidance. For example, PCB cleanup levels are 10 ppm for courtyard soil, 25 ppm for southern area "Hot Spots", any oil for groundwater, and 1 ppm for sediment, which ESE has discussed at length as an inappropriate application of policy not based on risk (refer to Comment 2).

EPA has developed a remedy to address the risks identified in Table 1 when there are no risks once the errors and deficiencies are corrected. The remedy is based on improper and inappropriate applications of policy that is not risk-based. Therefore, the proposed remedy is not warranted.

COMMENT 39. FIGURES 2 AND 2A AND THE CONDITIONS REPRESENTED (PAGE 12). CESAR

Figures 2 and 2A are represented by EPA as accurately reflecting site conditions. However, they are not consistent with information evaluated by ESE. As mentioned in Comment 1, there is no basis for the identification of the "NAPL AREA." Comment 6 discusses the information contradicting the arrow showing that groundwater flow reverses under the site based on tidal influence. The locations of the underground storage tank on Figures 2 and 2A do not agree with each other or with historical information. An 8/8/85 affidavit of Roosevelt Thorton [Thorton 1988] and EPA's hazardous materials report [EPA 1977] show the tank and pad as being located within 30 feet of the bank of the Delaware River. Since the location of the tank has a direct bearing on the area that contained LNAPL, and on that portion of the remedy addressing the UST, then the location should be accurately marked on the Figure.

Figure 2 shows the river sediment and mudflat areas requiring remediation as defined in the Earth Tech FS. The delineation of sediment areas requiring remediation does not take into consideration the data collected in January 1995, indicating off-site sources of PCB contamination, nor does it accurately reflect the laboratory data collected during the RI [ESE 1995b, section 2.3.6]. ESE has commented on the available information indicating that the PCBs in mudflats and River sediments have been shown as not originating at the Metal Bank site (refer to Comment 2, 3, and 12).

As previously stated (refer to Comment 1) the available information does not support identification of an LNAPL layer or area at the site. In addition, it appears that EPA based this NAPL area on TPH detections, which do not necessarily correlate with PCB detections. It is PCB concentrations, not TPH, which are driving remediation. EPA [1995] compares PCB levels with TPH levels at the Metal Bank site, and concludes that there is no correlation between the two materials. EPA states that,

> "the PRP's criteria for remediating PCBs based upon TPH values exclusively was faulty."

In addition, PCBs are immobile and not a NAPL, and can only be mobilized through the action of a transport media. Mobile TPH would potentially act as that media. Without a transport media, there is no method for PCBs to migrate, so there is no exposure and no risk. Therefore, remediation areas should be based on the co-location of both PCB and mobile TPH (i.e. LNAPL), of which there is none.

Figure 2A indicates that large amounts of courtyard soils are contaminated, and identifies PCB "Hot Spots" which are at different depths in the southern portion of the site. The analytical data show that there are only a few isolated "Hot Spot" concentrations (refer to Comment 8). Based on EPA's incorrect risk calculation, only the "Hot Spot" areas contain concentrations of PCBs high enough to consider removal. More importantly, the significant concerns associated with EPA's identification of "Hot Spots" based on inappropriate application of policy-based numbers have been described in Comments 2 and 8. The conclusions reached by ESE are that appropriately developed, site-specific, risk-based cleanup levels do not warrant remediation of "PCB Hot Spots".

The use of photographs and descriptions of oil sheens and oil dripping off of sampling equipment in Figure 2A is compelling to the lay reader but unscientific and unsubstantiated. EPA would (and should) not accept conclusions based on such data. ← A PICTURE WORTH A THOUSAND WORDS?

ESE concludes that, Figures 2 and 2A do not accurately portray site conditions as documented by the RI and supporting data. These Figures do not clearly describe several important qualifying facts that would allow conditions existing at the Metal Bank to be understood by the public. These Figures provide information in a manner that will mislead the public. As presented, the Figures suggest support for EPA's rationale for remedial action, which is not supported by site-specific data and evaluations.

COMMENT 40. DETAILS OF THE PROPOSED ALTERNATIVE (PAGE 12).

[CEDAR & BETSY]

EPA states that "This alternative represents a combination of several components of Alternatives C-5, C-7, C-8 and C-12." However, this statement is not correct. None of the alternatives evaluated in the FS included removal of subsurface soil "Hot Spots" in the southern portion of the site. Neither this component nor alternative C-7A taken as a whole has ever been evaluated in the FS or otherwise in accordance with the criteria established by EPA guidance and the NCP.

EPA incorrectly indicates that alternatives C-7A consists of components of other alternatives that have been through the full evaluation performed during the FS. Neither the proposed alternative as a whole, nor a significant component, has been evaluated according to the requirements of guidance and the NCP.

COMMENT 41. DETAILS OF BUILDING AREA REMEDIAL ACTIONS (PAGE 12, ITEM 1 AND PAGE 13). [CLEAR 1 BETTER]

EPA states that the risk of worker exposure in the Building Area is at an acceptable level and does not warrant action. Therefore, there is no need for a fence to:

> "...restrict the public from being in contact with the PCB contamination inside the Building Area...".

This is one example of the inconsistencies ESE identified with EPA's proposed alternative.

Another inconsistency has a significant impact on the costs associated with the proposed alternative. EPA states on page 13 that a fence around the site boundary is capable of preventing contact by trespassers as well as being capable of protecting control systems that would be installed as part of the remedy. EPA also states that deed restrictions would be capable of preventing future site use. Yet, EPA did not consider these as appropriate for protecting future remedial response or other construction workers who would violate OSHA regulations and come into direct contact with the PCBs during remedial actions or excavation on site (page 8, item 4, and Comment 21). EPA is correct in stating that deed restrictions are appropriate for controlling future development and site use. Therefore, the risk to future workers from exposure to subsurface oil in general and PCBs in particular can be addressed through a deed restriction prohibiting excavation without appropriate protection. This eliminates the need to address any perceived subsurface condition to address any potential direct exposure scenario.

ESE's limited further action alternative developed for the site makes use of institutional controls, fences, vegetation and maintenance, and monitoring to eliminate many of the routes of exposure listed as a concern by the EPA [ESE 1995b, section 3.2.3]. ESE concludes that the limited action alternative would meet the requirements of the NCP at costs significantly lower than those of the proposed alternative C-7A.

EPA's proposed remedy includes provisions to address the building even after stating that there is no risk posed by the building. This is not consistent with EPA guidance or the NCP. Further, EPA accepts site controls such as a fence and deed restrictions as appropriate in this case, but apparently ignores these same controls when evaluating options and potential risks posed to future workers. The use of institutional controls to prevent future development of the site eliminates the direct contact risk to future construction workers, an exposure scenario identified by EPA.

COMMENT 42. DETAILS OF COURTYARD SOIL REMEDIATION (PAGE 13, ITEM 2). [Roy]

As stated in Comment 2, EPA inappropriately applied guidance and policy to determine the cleanup levels for PCBs remaining at the site, including those in the Courtyard Area. The 10 ppm number proposed by EPA is not a site-specific, risk-based number developed to reflect site conditions. Therefore, EPA should have developed a risk-based number specifically for the site. If this had been performed, then as shown on EPA's Table 1, the EPA calculated risk of $7x10^{-5}$ would be within the range considered acceptable under the NCP, and remediation would not be required.

As stated in Comments 13, 14, 15, 16, and 18, ESE evaluated EPA's Baseline RA, corrected errors and deficiencies, and concluded that there was no risk posed by soil in the Courtyard [ESE 1995a, section 3.2]. ESE evaluated the available information and determined that limited further action that does not include courtyard PCB removal would meet the requirements of the NCP.

An appropriate evaluation of guidance and policy would have resulted in EPA evaluating the risks posed by the Courtyard soil to determine the need for remediation. There is no requirement for remediation since EPA already has calculated that the Courtyard soil, without remediation, is within the range considered acceptable by the NCP.

COMMENT 43. DETAILS OF RIVER SEDIMENTS AREA REMEDIATION (PAGE 13, ITEM 3, FIRST TWO PARAGRAPHS). [Jobb]

ESE has commented previously (Comments 2, 3, and 12) that remediation of PCBs in River sediment and the mudflats is not warranted by correctly calculated site risks. These comments demonstrate that EPA's Proposed Plan for remediating sediments is not based on actual risk, and may actually cause more harm and create more risk than is posed by the existing conditions.

ESE also has discussed (Comments 2 and 12) the inappropriate nature of the 1 ppm PCB cleanup level proposed by EPA.

On page 13, EPA states that:

> "Oversized materials such as boulders would be decontaminated and reused as Riprap while unsuitable debris would be disposed off-site."

It is not clear from Figure 2A and page 13 that a riprap wall would still exist on the sideslopes of the site after installation of the oil interception trench and permanent sheet pile wall. The EPA's Proposed Plan states that a permanent sheet pile wall would be installed to prevent fill materials located in the southern portion of the Site from sliding into the river. The installation of a sheet pile wall and reuse of the cleaned riprap appear mutually exclusive. Unless the riprap is reused on-site after cleaning, the costs for off-site disposal are likely to be much greater than those stated by EPA.

ESE [1995b, section 2.3.3] concluded that sheet piling could not be driven to the depth stated in the FS through the urban fill material along the western and southern edges without encountering obstructions that could negate the effectiveness of the entire wall. EPA does not address within the text the obvious difficulties of driving sheet piling at the Metal Bank site, but acknowledges this difficulty in Footnote 18 to Table 3.

ESE concludes that EPA has proposed a remediation program for sediments that is not justified by the calculated risks. Further, EPA is not clear regarding the mechanism by which certain portions of the plan will be carried out, specifically with regard to riprap and the sheet pile wall. ESE's evaluation has identified a high potential that obstacles will be encountered that will render the sheet pile wall ineffective.

COMMENT 44. DETAILS OF RIVER SEDIMENTS AREA REMEDIATION (PAGE 13, ITEM 3, THIRD PARAGRAPH). [Jtg]

EPA appears to be building redundant measures into it's preferred alternative without a clear purpose. EPA does not provide a basis for its stated concern that, despite the excavation of all soil within the southern portion of the site with PCB levels greater than 25 ppm, mobilizable, PCB-containing LNAPL would still remain in the soil such that a recovery system is required.

EPA states that the subsurface trenches and oil-water separators would collect and separate the floating PCB-contaminated oils that are being discharged with the groundwater. As discussed in Comments 1, 2, 3, 6, 8, 11, and 12, the information presented in the RI demonstrates that LNAPL does not exist, and is not discharging with the groundwater.

As discussed in Comment 4, ESE concludes that there is no basis for EPA's concerns about the potential presence of DNAPL. Furthermore, if the LNAPL collection system must be modified to also collect DNAPL, this could, depending on site conditions, significantly increase the cost of the system. EPA apparently did not consider this when costing the new alternative, because the costs as presented in the EPA's Proposed Plan do not differ from those presented in the FS which did not mention the possibility of the system addressing DNAPL at all.

EPA states that "Hot Spot" remediation to the stated level of 25 ppm will remove the (unsupported) potential for PCBs to migrate in the groundwater at unacceptable levels. Yet, on page 13, EPA states that the separators to be installed along the edge of the site will eliminate the threat posed by the residual contamination. Removal of the "Hot Spots" as proposed by EPA removes the threat from the remaining PCBs, eliminating the need for separators, yet this inconsistency is not identified nor addressed by EPA.

Available information indicates that groundwater remediation is not required at the site. Yet EPA proposes a groundwater recovery system that is unnecessary, and redundant, and does not provide an explanation based on documented site conditions to justify its position.

COMMENT 45. DETAILS OF RIVER SEDIMENT REMEDIATION (PAGE 13, ITEM 3, LAST PARAGRAPH). [JA42]

In the third sentence, EPA states:

> "The exact area and depth of the sediments to be removed cannot be determined from the data collected during the January 1995 sampling effort."

Justification for this statement is not provided. It is not apparent from the rest of the EPA's Proposed Plan that EPA has incorporated these data into the river sediment evaluation. As stated by ESE in Comment 12, ESE's Engineering Evaluation (ESE 1995b, section 2.3.7), the information indicates that there are no patterns of PCB concentrations in Delaware River sediments identifying the Metal Bank site as their source. ERM [1995, section 2.3.1.3] also

concluded that the PCB contents of the sediments adjacent to the site are not related to previous site activities.

The 300 foot line specified in the second to last sentence of the paragraph appears arbitrary. Land-based excavation with standard equipment could only be performed a limited distance from shore (i.e. perhaps within 20 feet). Any sediment excavation beyond this point without dewatering measures would require much more complicated and expensive measures (such as the cofferdam and use of dredging equipment included in the remedial alternative). Strong currents and 10-foot depths within 300 feet of the shore will make implementation using these measures difficult.

However, it is not clear from EPA's documentation that the potentially significant cost increases associated with dredging and water control along the Delaware River have been taken into consideration. ERM [1995, section 2.3.1.6] concluded that the assumptions contained in the FS, and presumably carried through in the proposed plan, were incorrect. ERM estimated that the FS may have underestimated the volume of water that would be generated by a factor of 10.

EPA's proposed alternative includes dredging of river sediments, a process that EPA acknowledges could be difficult and expensive. However, EPA does not address these difficulties either in the Proposed Plan, or apparently in the estimate of costs. Calculations indicate that the amount of water that may be generated and require handling could be underestimated by a factor of 10. Finally, as pointed out by ERM [1995, section 2.3.1.5 and 2.3.1.6] there may be greater harm caused by implementing the proposed method than is calculated as currently posed by the existing situation.

COMMENT 46. NAPL AREA IN THE SOUTHERN PORTION OF THE SITE (PAGE 14, ITEM 4).

EPA identifies the NAPL Area as "saturated with oil," and concludes that this is the sole source of the PCB contamination to the Delaware River from the Site. As discussed in Comment 1, EPA's statements regarding the existence of LNAPL are not supported by the available information. Further, as pointed out in Comments 2, 3, 7, 8, 9, and 12, EPA's statement regarding the Southern Area as the source of PCBs entering the River from the site is not supported by the data.

The available information does not support EPA's statements that a LNAPL layer exists at the site, and that this LNAPL is the sole source of PCBs entering the River from the site. The RI data does support a conclusion that no LNAPL exists at the site. Therefore, EPA is proposing an alternative that addresses conditions that are not shown to exist at the site.

COMMENT 47. RISKS IDENTIFIED BY THE BASELINE RISK ASSESSMENT AND REMEDIATION OF THE SOUTHERN AREA (PAGE 14, PARAGRAPH 2). [NAG & CESAR]

EPA states that the human health, terrestrial, and aquatic risk assessments all have concluded that there is a threat to river sediments and organisms from site-related PCBs and other contaminants of concern. ESE concludes that the Baseline RA is flawed. Both ESE and ERM conclude that there are no risks at levels of regulatory concern posed by PCBs remaining at the site. This has been discussed at length in various comments, including Comments 2, 3, 12, and 13 through 35.

EPA bases its proposal to address PCBs remaining at the site on a flawed assessment of risks. ESE's recalculation of the risks posed by the site identified no risks at levels of regulatory concern that required remediation.

EPA mentions groundwater and tides serving as the mechanism to flush contaminants from the site. As pointed out in Comments 1, 2, 3, 7, 10, and 11, this statement is not valid.

EPA states that the "Hot Spot" remediation will take place to remove PCBs at levels above 25 ppm. Comment 2 discusses the reasons for ESE concluding that the 25 ppm level is not appropriate for the site. Assuming that it is appropriate to use a soil contact risk-based clean up level to address the potential for groundwater impacts, it appears EPA has arbitrarily selected the 25 ppm PCB clean up level, when precedence exists for use of a 50 ppm level (i.e. in the vicinity of the UST). The use of the more appropriate 50 ppm level would eliminate the entire southern portion of the site from consideration. As stated in the RI:

> "Order-of-magnitude differences between vertically adjacent samples, and the absence of the same constituents in groundwater at the same or downgradient locations as the soil samples, suggests little or no migration of contamination from subsurface soil to groundwater." [EARTH TECH 1994a, page 6-5],

and

> "However, a comparison of the locations and concentration of these compounds [PCBs, SVOCs, TPH, VOC and metals] with their distribution and concentrations in groundwater shows that contaminants in soil do not appear to be migrating to groundwater. ... In fact, the erratic distribution of contaminants in soils both horizontally and vertically suggests that there is virtually no movement of contaminants within the soil itself." [EARTH TECH 1994a, page 6-6]

There is no justification for the EPA's determination that levels above 25 ppm will present a "continuous threat" due to PCB migration from soils.

There also is no basis for EPA characterizing the UST as leaking, and there is a basis for characterizing it as non-leaking. As discussed in Comment 7, several observations indicate that the tank was cleaned, and all PCB-containing oil removed.

The available information does not support EPAs statements that the Baseline RA documents a risk posed to aquatic organisms, that cleanup of PCBs is required, that a cleanup level of 25 ppm for PCBs in the Southern Area is appropriate, and that the UST is leaking.

COMMENT 48. DELINEATION AND REMOVAL OF THE SOUTHERN AREA "HOT SPOTS" (PAGE 14, PARAGRAPH 3). [CESAR & JAS]

As previously discussed in Comments 2, 3, 7 and 47, the identification of PCB "Hot Spots" is based on an inappropriate application of EPA guidance and policy. Risk assessment calculations have documented that the PCBs have not been shown to present a risk at levels of regulatory concern.

EPA also says that Figure 2A illustrates 3 major areas of PCB-contaminated subsurface soil. As has been discussed in Comment 2, the basis for identifying "Hot Spots" is inappropriate. Further, the PCBs that concern EPA are limited to small intervals in several small areas.

EPA's statements regarding the PCB "Hot Spots" and the need for remediation are not supported by available data and rely on inappropriate application of EPA guidance, policy, and regulation.

COMMENT 49. SOIL COVER AS APPROPRIATE FOR USE IN THE SOUTHERN AREA (PAGE 14, PARAGRAPH 5).

EPA states: [CESAE & BOB]

> "Once the Hot Spots are removed and the voids are backfilled, a soil cover would be constructed over the entire Southern Portion of the Site....Site restoration would also include specific measures to promote wildlife habitat diversity."

However, Alternative C-4 of the FS was rejected during the initial screening due to its use of a soil (i.e. permeable) cap. As stated in the FS [EARTH TECH 1994a, page 3-11] the alternative is considered:

> "...administratively difficult to implement because the permeable cap would not comply with the Commonwealth's Hazardous Waste Regulations that require an impermeable cap over any surface waste disposal pile. Therefore, Alternative C-4 is eliminated from further consideration." [Emphasis in original]

All alternatives considered in the FS's detailed evaluation incorporate an impermeable cap to meet this administrative feasibility issue. Additional discussion of capping evaluations in the FS are provided in ESE's engineering evaluation [ESE 1995b, section 2.3.5]. The EPA's Proposed Plan specifies a soil cover, which means that the EPA appears to be either disagreeing with the FS regarding the applicability of the referenced regulations, or is ignoring the applicable or relevant and appropriate requirements (ARARs) of the Commonwealth. This inconsistency is not explained in the EPA's Proposed Plan.

Another unexplained inconsistency in the EPA's Proposed Plan is that Table 2 appears to be based on the costs of an impermeable cap developed in the FS, even though the proposed remedy is for a soil cap.

EPA also does not provide any information as to the specific measures to promote wildlife diversity that would be incorporated into the restoration activities, and no additional costs to implement ~~this~~ diversity promotion have been included in their cost tables. EPA also does not justify wildlife promotion in a heavily industrial area, and without considering intended future site use.

EPA's description of the soil cap does not agree with statements made in the FS regarding the applicable Pennsylvania ARARs, and no discussion of this is provided in the Proposed Plan. EPA also uses costs from the FS for an impermeable cap when the proposed remedy specifies a soil cap. Finally, EPA acknowledges the need to promote wildlife diversity, but does not explain why this is appropriate on property zoned for heavy industry, does not include details on how this will be accomplished, and does not evaluate or include additional costs for implementation.

COMMENT 50. BASIS FOR GROUNDWATER REMEDIATION (PAGE 14, ITEM 5, FIRST PARAGRAPH). [BRUCE & CESARE]

EPA states that no groundwater remediation is proposed:

> "Since the level of groundwater contamination and potential for off-site migration will decrease following removal of Hot Spots, EPA proposes no groundwater remediation."

As stated in Comments 1, 2, 3, 6, 10, 11 and 12, groundwater contamination may be caused primarily by upgradient and off-site sources, which will not be impacted by the EPA Proposed Plan. Also, as previously discussed, the available information does not support EPA's statements that migration off-site of groundwater contaminated by site-related compounds is occurring. Finally, as pointed out in Comments 13 through 35, the concentrations of contaminants found in groundwater have not been shown to cause a risk at levels of regulatory concern.

There is no basis for the statements that groundwater contamination and the potential for migration will decrease because of the proposed remedy. As acknowledged by EPA and demonstrated by ESE risk calculations, there is no risk at levels of concern posed by site groundwater and, therefore, no requirement to implement groundwater remediation.

COMMENT 51. PCB DISCHARGE AFTER IMPLEMENTATION OF THE PROPOSED REMEDY (PAGE 14, ITEM 5, SECOND PARAGRAPH). [JAY]

EPA maintains that removal of the "Hot Spots" will reduce levels of groundwater contamination. However, EPA then proposes monitoring to confirm that this is the case. This is another example of redundant measures EPA has built into its proposed remedy. EPA seems to be indicating that, despite the excavation of "Hot Spots" and installation and operation of an interceptor trench, residual contamination would continue to discharge from the site, a scenario that is not supported

by the available data in any event. RI data indicate that PCBs are not discharging from the site at levels that would pose an unacceptable risk (refer to Comments 2 and 12.).

EPA has not provided the basis for implementing multiple, redundant measures at considerable cost as part of its proposed remedy.

COMMENT 52. ADDITIONAL GROUNDWATER INVESTIGATION (TOP OF PAGE 15). [JAY & KEVIN HESS]

EPA states that the monitoring program may include wells upgradient and outside of the Metal Bank property in order to determine actual background levels of ground water contamination. Yet, EPA is moving forward with proposing a groundwater remediation system for the site before confirming that the site is the source of groundwater contamination. This is not consistent with standard practice and various EPA guidance documents concerning groundwater investigations. The result is that EPA is proposing a remedy for groundwater that may not address the real sources of the contamination at the upgradient edge of the Metal Bank site (refer to Comment 6).

EPA also states:

> "During Remedial Design, an investigation would also be performed on the lower groundwater aquifer to determine whether DNAPLs are discharging into the Delaware River or to the Torresdale water intake."

There are no indications of DNAPL in the upper aquifer (Refer to Comment 4). Therefore, it is not technically feasible for the lower aquifer to have been impacted by DNAPL. Also, there is no technical basis for EPA's concern that DNAPL from the site could be discharging to the Delaware River, then move upstream for 2.1 miles, and enter the Torresdale water intake.

The additional groundwater investigation program proposed by EPA may confirm groundwater contamination by upgradient sources, eliminating the need for the groundwater remediation components of EPA's Proposed Plan. EPA's identification of a potential for DNAPL is inconsistent with the RI data. EPA's stated concern that any DNAPL threatens the Torresdale Water intake is not technically feasible.

COMMENT 53. LONG-TERM MONITORING PROGRAM FOR BIOLOGICAL SPECIMENS (PAGE 15, FIRST FULL PARAGRAPH).

[Jay & Bob]

EPA proposes a long-term monitoring program to assure that the remedy remains protective of aquatic life. The detailed components of this program are not specified so that it cannot be evaluated.

As stated in Comments 2, 3, and 12, numerous studies have been performed throughout the Delaware River and have documented the wide-spread nature of low levels of PCBs. Various studies have shown that the PCB pattern found at low levels in sediments near the Metal Bank site demonstrate that they are not from the site [ESE 1995a, sections 4.3.5.4, 4.3.5.5, 4.3.5.6; ERM 1995, sections 1.2, 2.3.1.3]. As stated in ESE's risk assessment review [ESE 1995a, section 4.3.5.5], there is no measurable impact to the aquatic system in the mudflats. PCB patterns present in fish indicate there is no connection to the Metal Bank site [ESE 1995a, section 4.3.5.6].

Therefore, a monitoring program to determine the long-term impact of the remedy likely will conclude that there is no long-term beneficial effect because the PCBs that presumably will be measured are from multiple sources and throughout the Delaware River.

If the monitoring begins after EPA implements its program, then the program would be measuring the recovery of the habitat in the mudflats and the near-shore Delaware River after its destruction as part of the excavation and removal of sediments. This would show a recovery of the habitat, not because the remedy removed contaminants that were having an adverse effect, but because the remedy first removed all the organisms.

The proposed monitoring is another example of the multiple, redundant remedial measures built into EPA's alternative to address unsubstantiated risks.

The long-term monitoring is not necessary because the remedy being "monitored" has not been shown to be necessary. The available data show no connection between PCBs in the aquatic environment and the Metal Bank site. PCB contamination throughout the Delaware River will hinder evaluation of any long-term monitoring of PCBs proposed for the site.

2.5 Comments - Evaluation of Proposed Alternative

COMMENT 54. EVALUATION OF PROPOSED ALTERNATIVE - GENERAL COMMENT (PAGE 15, ITEM V). [CESAR & BETSY]

EPA has developed and selected a new alternative that was not included in the FS. Therefore, this alternative has not undergone detailed evaluation under the NCP criteria and EPA guidance. It is only mentioned in summary form in the EPA Proposed Plan. This alternative should be subjected to the same level of evaluation as the alternatives to which it is being compared to be consistent with EPA guidance and the NCP.

COMMENT 55. OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT (PAGE 15). [Roy]

As stated in Comment 36, EPA does not appear to have developed its alternative based on the RAOs in the RI/FS, and therefore, the objectives are unclear. As a result, the proposed remedy contains inconsistencies and incorporates components that are not shown to be necessary.

None of the items EPA identifies as providing overall protection have been shown to be necessary. As an example, EPA says that the preferred alternative would provide overall protection of human health and the environment by:

> "...reducing the potential for direct contact exposure to the contaminants."

Yet EPA states on p.16, 2nd full paragraph, regarding the potential for exposure of children [see Note [1]] at the adjacent day care center to contaminants at the Site, that;

> "...since the PCBs are deep within the subsurface soil, skin contact is nearly impossible."

In any event, soil sampling performed for Metal Bank by VERSAR, [Versar 1988] and sampling conducted by EPA in 1989 [EPA 1989] confirmed that the Metal Bank site presented no significant risk to St. Vincent's School. This has been discussed previously in Comment 18.

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[1]St. Vincents is in actuality not an orphanage. It is a temporary shelter (maximum of 90-days) for children ages 2-12 that are victims of child abuse.

EPA states that human health and protection would be provided by removing "Hot Spots". Yet this has not been shown to be accurate or even necessary as stated in many comments, including Comment 2.

EPA states that the leaking UST must be removed to provide overall protection; however, as pointed out in Comment 6, information indicates that the UST is not leaking.

EPA states that the oil-water separator and the permanent sheet pile wall will intercept any residual contamination, yet as discussed in Comments 1, 2, 3, 6, 10, 11, 12, 50, 51, and 52, groundwater remediation and the sheet pile wall are not necessary. Further, removal of the "Hot Spots" as proposed by EPA will remove the EPA's identified source of contaminants, again eliminating the need for groundwater remediation and the sheet pile wall to address residual contamination.

As pointed out in Comments 13 through 35, ESE concluded that the conditions present at the site do not represent a risk to human health or the environment at levels that would require remediation. The limited action alternative evaluated by ESE [1995b, section 3.2.2], can be implemented for lower costs and provide the same level of protection to human health and the environment.

COMMENT 56. REMOVAL OF CONTAMINATED SEDIMENTS (PAGE 15, PARAGRAPH 3). [JAY & BOB]

EPA states that when contaminated sediments are removed from the "river habitat" adjacent to the site:

> "The major sources of river contamination will be removed...".

As discussed in Comments 12, 15, 19, 29, 33, 34, 36, 43, 44, 47, 53, this has not been shown to be necessary through either a connection of the PCBs in the river habitat to the site, or through the risks presented by the PCBs in the sediments. In any case, PCBs from acknowledged sources in the Delaware River and the constant re-working of sediments will likely cause PCB levels to return to the current values after the clean fill is placed.

As described in ESE's engineering evaluation [ESE 1995b, section 2.3.7] and by ERM [1995, sections 1.2, 1.3, 1.5, 2.3.1.3] there are numerous potential off-site sources of contamination to the River, including barge traffic and sewer overflows. Recent sediment data support the

presence of off-site PCB sources that would not be addressed by EPA's proposed remedy for the Metal Bank site. These sources would continue after remediation, and likely return PCBs to the clean fill at levels similar to those EPA seeks to remediate. This would result in no net benefit, and would require destroying the existing biologically active habitat in order to complete the remediation.

As pointed out in Comments 12, 15, 19, 29, 33, 34, 36, 43, 44, 47, and 53, ESE concluded that PCB concentrations identified in the sediments adjacent to the Metal Bank site do not represent a risk to human health or the environment at levels that would require remediation. Therefore, remediation of sediments has not been shown to be necessary, will have a short-term adverse impact on the environment, and result in no long-term benefit.

COMMENT 57. COMPLIANCE WITH ARARS (PAGE 15). [Jay, Betsy, Kevin Hess]

EPA indicates that only off-site upgradient wells can indicate the levels of constituents in groundwater that are due to existing background conditions. There is information indicating the quality of groundwater flowing onto the site, and numerous references to off-site and upgradient potential sources of contamination (refer to Comment 6). EPA should not recommend a multi-million dollar remediation program based on an inconclusive identification of the source(s) of the groundwater contamination.

It is equally correct to re-state the last sentence of the first paragraph under the discussion of ARARs as follows:

> However, since no samples were taken of the upgradient and off-site wells, in areas where other potential sources of groundwater contamination exist, and contaminant concentrations generally decrease along the downgradient edge of the site, it cannot be conclusively shown that levels of contaminants in Site groundwater were due to releases from the site.

EPA also references Pennsylvania law that establishes cleanup standards in the Commonwealth, including remediation to either risk-based standards or background water quality. EPA mentions that the absence of off-site, upgradient wells prevents the identification of background water quality. However, off-site wells would not reflect contamination which results from fill materials placed over time at the site, but is not related to the release of regulated substance at the site.

Paragraph 7 of page 15 states that,

"Appendix A of the FS evaluated and recommended disposal of contaminants at 10,000 ppm TPH."

In fact, Appendix A of the FS calculates the volume of residual oil which could be immobilized by the site soils. Neither Appendix A nor B recommended disposal of contaminants at a specific value.

Paragraph 7 of page 15 states that a clean up level of 25 ppm PCBs is recommended by guidance. Page 14 paragraph 2 of the EPA's Proposed Plan states that the standard for removing PCBs would normally be 50 ppm. This is inconsistent. As discussed by ESE in Comment 2, the 25 ppm PCB cleanup level is based on an inappropriate application of guidance and policy, and should not have been used. Instead, cleanup of PCBs should be driven by risk-based calculations. As ESE pointed out in Comment 2, an appropriate evaluation would have concluded that no remediation was necessary to address the remaining PCBs because they did not represent a risk of regulatory significance.

On page 16, EPA mentions the PCB disposal regulations, the proposed revisions to these regulations, the PCB Spill Policy, and the EPA guidance on Superfund sites with PCB contamination as the basis of its clean up level. Comment 2 discusses these in detail, and concludes that a risk-based cleanup standard is appropriate for the Metal Bank site, not the policy based number of 25 ppm set by EPA. As an example of the issues evaluated in Comment 2, EPA states that the recommended cleanup level for subsurface soil is 25 ppm to 50 ppm. However, the CERCLA PCB guidance states [EPA 1990, section 3.1] that these numbers are those concentrations above which action should be considered. Further, the guidance not only allows flexibility when formulating cleanup goals, it strongly suggests that risk-based numbers should be developed. (Refer to Comment 2.)

EPA mentions the human health risks as a basis for requiring remediation. As mentioned in Comments 13 through 21, and in ESE's evaluation of EPA's Baseline RA, [ESE 1995a, section 3], EPA's baseline RA contains errors and deficiencies that, when corrected, indicate that there is no risk shown at levels that are of regulatory concern. This contradicts EPA's statement regarding the danger of PCBs in the southern portion of the site.

As another example of the internal inconsistencies within the EPA's Proposed Plan, the EPA states that the PCBs are deep within the subsurface soil, and that a soil cover and a perimeter fence will eliminate human access. However, potential exposure to future construction workers at the site, including unprotected remediation contractors violating OSHA regulations and not

wearing protective clothing, is one of the scenarios EPA uses to justify excavation of the "Hot Spots".

EPA states that they are confident that remediation of subsurface soil to the 25 ppm concentration level for PCBs would protect terrestrial and aquatic organisms; however, as pointed out in Comment 2, EPA has not supported this conclusion. ESE evaluated the Terrestrial and Aquatic RAs and found them to be flawed [ESE 1995b, sections 4 and 5]. ESE concluded that there was no risk of regulatory concern demonstrated by the RI and Baseline RA (when corrected) and therefore, remediation is not required.

EPA states (page 17, paragraph 5) that the Aquatic RA concluded that PCBs of greater than 1 ppm PCBs and 32 ppm PAHs pose an unacceptable risk. However, as pointed out by ESE [1994a, sections 4.3 and 4.5] and ERM [1995, sections 2.3.1.1 and 2.3.1.4], the Aquatic RA as performed by NOAA contained errors and deficiencies. ESE's recalculations [ESE 1995a] support a conclusion that the site does not represent an aquatic risk and therefore does not require further remediation. This is discussed in Comments 23, 27, 28, 31, and 35.

[BoB & CK]

EPA's text addressing compliance with ARARs does not address the administrative requirements associated with construction within the floodplain, permitting or variances required for regulations relating to impacting wetlands, and of variances required for remediation activities within 50 feet of a property line or encroachment on wetlands and rivers. Although these issues are mentioned in footnotes to Table 3, they should be discussed in the text and not downplayed by the Agency. This issue is discussed further by ESE in its engineering report [ESE 1995b, sections 2.3 and 2.3.4].

EPA's discussion of compliance with ARARs indicates that the proposed remedy fully complies with the ARARs identified; however, this evaluation is based on inappropriate application of policy and guidance, and therefore is incorrect. It also does not adequately address the significant administrative difficulties (e.g. permitting), associated with implementation. Also, many of the remediation decisions are based on the flawed baseline RA performed by EPA and its support contractors. Recalculation of risk and an appropriate evaluation of ARARs would indicate that remediation is not required because there are no risks demonstrated at levels of regulatory concern.

COMMENT 58. PCB CLEANUP STANDARDS (PAGE 16). [JAY & ROY]

EPA is using human health risk-related clean up standards to derive the clean up level for subsurface soils, when the objective of subsurface soil excavation is to prevent groundwater impacts. This is inconsistent. This issue has been addressed in Comments 2, 15, 18, 20, 21, 55, and 57.

EPA is using a cleanup number for direct human contact, yet acknowledges that there is no potential for direct human contact once deed restrictions and fencing are completed. EPA did not calculate the PCB level that would yield groundwater concentrations that would be protective of aquatic organisms.

COMMENT 59. SAFEGUARDS TO ADDRESS THE 100 YEAR FLOOD (PAGE 17, LAST FULL PARAGRAPH). [CK, BRUCE & JAY]

EPA states that:

> "To prepare for the detrimental effects of flooding water on the Site, the Remedial Design must build in safeguards that would prevent the 100 year flood from entering into the Building Area and mobilizing unremediated PCBs."

The entire Building Area is not within the 100-year floodplain. EPA's concerns that flooding water would remobilize PCBs within the building are unsubstantiated. The PCBs in the building are adsorbed onto building materials and not considered by EPA as posing an unacceptable health risk.

EPA states that:

> "a portion of the Site is expected to be under 10 feet of water during a 100-year flood".

The FS [EARTH TECH 1994a, page 4-28] states that the 100-year flood elevation is 10 feet in reference to the National Geodetic Vertical Datum of 1929 according to Federal Emergency Management Agency (FEMA) maps, and that the current elevation of the southern portion of the site is approximately 10 feet. Therefore, a 100 year flood would barely submerge the southern portion of the site. Given that the remediation program implemented during the 1980's ended with inundating a portion of the southern area with water from the Delaware River and no impact

was observed (refer to comment 1), inundation of a small portion of the southern area should not cause an overwhelming migration of PCBs as maintained by EPA.

EPA states that "Hot Spot" remediation:

> "will prevent an overwhelming migration of PCBs from re-entering the river."

There is no basis for EPA's statement implying that the PCBs remaining at the Metal Bank originated in the River and therefore could "re-enter" the River as a result of a flood.

EPA has not justified the need for building safeguards into the remedial design to prevent the 100 year flood from impacting the site.

COMMENT 60. LONG-TERM EFFECTIVENESS (PAGE 18). [CK]y

EPA states that removal of the courtyard soil and the UST would eliminate the environmental impact from PCBs, yet they propose a sheet pile wall and recovery system to address PCBs. This is not consistent.

EPA does not state the method they will employ to inspect the permanent sheet pile wall for rust and corrosion when the wall will be buried. This apparently has not been factored in to EPA's evaluation.

In the third paragraph, EPA notes that the Oil/Water Separator would act as a contingency to ensure the effectiveness of the remedy if residual PCBs exist after "Hot Spot" removal. This contradicts the statement made in the first paragraph of this section. This means that EPA recognizes that the Oil/Water Separator and the associated containment wall are redundant. [JAS]

EPA does not indicate its assessment of the long-term effectiveness of the sediment removal action proposed for the mudflat and the River. As pointed out previously (Refer to Comments 2, 3, 12, 15, 25, 36, 39, 43, and 53) the proposed action will temporarily destroy the habitat to remove the PCBs, and will not address PCBs throughout the Delaware River. Over time, PCB concentrations in the clean fill will likely approach those EPA is proposing to remediate because of the normal movement and deposition of sediments in the River.

The sediment remediation program proposed by EPA does not appear to be effective in the long-term. EPA does not specify the mechanisms they will employ to inspect the various

components of the system, especially the sheet pile wall. EPA's discussion indicates that the sheet pile wall and oil-water separators are redundant. EPA does not discuss redisposition of PCBs from the Delaware in the remediated areas over time.

COMMENT 61. SHORT-TERM EFFECTIVENESS (PAGE 18). [JAY & BOB & ROY]

EPA has greatly down-played the short-term risk associated with the proposed remedy. There would be an increased short-term risk to the community and workers associated with this alternative, since it includes the excavation, handling and transportation of contaminated soil. ERM [1995, section 2.3.1.6] calculates that over 3,000 round trips by heavy trucks would be required to implement the proposed remedy. Given standard national accident rates, this translates to 15 accidents associated with this part of the remedy.

EPA also does not state that there would be an increased short term risk to the aquatic environment, as discussed in Comments 12, 53, and 55, and in ESE's engineering evaluation [ESE 1995b, section 2.3.7]. The dredging in the river and mudflats would temporarily destroy the habitat and the organisms currently living there. While this is noted on Table 3, note 17, it is not mentioned at all in the text. EPA's note to Table 3 classifies the impact as "minor," which is not the case. If destroying the existing habitat is "minor", then it is not appropriate to spend funds to remediate it, not matter what the source of the PCBs.

EPA also underestimates the risks associated with the generation of suspended solids during the proposed remediation. ERM [1995, section 2.3.1.6] evaluated this issue and concluded that the volume of water requiring disposal was much greater than that estimated in the FS, and that the liberation of PCBs during spoil dewatering could be a significant source of exposure not evaluated by the Baseline RA.

EPA's evaluation of the short-term effectiveness of the proposed remedy underestimates and downplays the risks associated with truck traffic, destruction of the mudflat habitat, and suspension and discharge of PCBs during sediment dewatering.

COMMENT 62. IMPLEMENTABILITY (PAGES 18 AND 19). [JAY & CK]

EPA's text discussion on pages 18 and 19 does not address the significant technical and administrative implementability concerns associated with the excavation and backfilling of river sediments, and the installation of the temporary sheet pile cofferdam, permanent sheet pile wall,

and oil-water separators (LNAPL collection system). These concerns are acknowledged by EPA in footnotes to Table 3 of the EPA's Proposed Plan. These issues are important and should have been addressed in the text of the Proposed Plan.

ESE evaluated the effectiveness and implementability of various components of the alternatives identified in the FS [ESE 1995b, section 2.3]. The significant difficulties associated with the sheet pile wall are described in section 2.3.3. The difficulties associated with the LNAPL collection system are described in section 2.3.4. The issues associated with sediment removal are discussed in Section 2.3.7.

EPA has not identified nor discussed the significant impediments associated with implementing their proposed remedy. The reason may be that EPA has not performed such an evaluation, and may be proposing a remedy that will be significantly more difficult and expensive to implement then is estimated in the Proposed Plan.

COMMENT 63. COST EVALUATION AND JULY 3, 1995 EVS MEMORANDUM. (PAGE 19). [JAY & CESAR] EVS

On Page AR302048 top of page [EVS 1995], a calculation is performed which converts volume of soil to pounds mass. This calculation incorrectly calculates water density as 59.84 pounds/ft^3. Water density is 62.4 pounds/ft^3. This change relates to the soils weight of 1.35 tons/yd^3, instead of 1.29 tons/yd^3. This results in an additional 600 tons of material to be disposed.

Page AR302048 Assumptions and Criteria, third paragraph, states

> "The amount of soil to be disposed of from the site was determined by the following criteria:
>
> 1) If detection limits were $\geq$25 ppm, it was assumed that soils in the area were $\geq$25 ppm.
> 2) Immunoassay screening results were reported at 10-50 ppm.
> 3) Tar was reported in the boring logs.
> 4) TPH concentrations were > 10,000 ppm."

However, cleanup criteria are supposed to be risk based, which for the "Hot Spot" and LNAPL areas are concerns of PCB and PAH contamination. Therefore, it is inappropriate to use immunoassay screening results, visible tar, or TPH concentrations to assume soils must be removed.

The cost calculation prepared by EPA significantly revises (i.e. decreases) costs for contaminated soils transport, tax, and disposal. However, the revised cost is only applied to some of the soils to be disposed of off-site. Revised costs were not applied to soils associated with the courtyard contamination and the UST removal. No mention is made as to whether this is because the costs are associated with disposal of soil as less than 50 ppm. Aside from being inconsistent in applying the new costs, it is inappropriate to attempt to compare this new Alternative's cost with those generated in the FS, which uses a value three times higher for transport and disposal of contaminated soils.

Page AR302052 discusses the costs and fees associated with waste disposal at Model City, NY, and does not address the $250,000 values included in the cost table for "...permitting of disposal." This cost was also included in FS Alternative C-12 without explanation.

Page AR302053 is the cost table for the selected alternative. Costs associated with the leachate collection and sheet pile wall were not varied from those developed in the FS, although this alternative says that the LNAPL collection system should be modifiable to also collect DNAPL and that remediation of river sediments should be considered out to 300 feet from the current shoreline, approximately three times more than proposed in the FS. As with the costs developed in the FS, no costs were included for the multiple handling tasks associated with excavating river and mudflat sediments, stockpiling them on site, and then backfilling the site "Hot Spot" areas with the sediments. The text calls for the use of a soil cover, but the cost table uses the costs associated with an impermeable cap, as developed in the FS. Engineering values were decreased by the EPA from 10% to 5%, and contingency values were decreased from 15% to 10% in this alternative, without any explanation.

ESE's conclusion is that the costs for Alternative C-7A cannot be compared with the costs for the FS alternatives because different cost factors were used in developing the C-7A costs, and the costs for the other options were not similarly revised. The result is that the costs for Alternative C-7A would have been higher than as stated in the EPA's Proposed Plan if the costs factors used in the FS had been applied.

Attachment A

Identification of ESE Comments on EPA's Proposed Plan

Superfund Program Proposed Plan

Metal Bank Superfund Site

Philadelphia, PA July 1995

EPA ANNOUNCES PROPOSED PLAN

SUMMARY

PROBLEM: Facility that recycled electrical transformers.

FINDINGS: Oil and Polychlorinated Biphenyls (PCBs) from the transformers remain in the soil and groundwater. Other contaminants such as metals and volatile and semi-volatile organic chemicals were also found. PCBs released into the Delaware River may cause harm to living organisms.

Tides from the Delaware River are flushing contamination from the Site. Regional groundwater flow may also be flushing the contaminants underneath the Site.

PROPOSED REMEDY: Remove PCB sources: an Underground Storage Tank; soils that contain PCBs greater than 25 ppm. Excavate contaminated sediments from the Delaware River and use it as Site fill if it is less than 25 ppm PCB. Separate PCBs/oil from the groundwater before it reaches the river.

WANTED: Your (Public) Comments. EPA may change the proposed remedy based on public comments. Therefore the public is encouraged to review & comment on the alternatives identified.

FOR MORE INFORMATION Read On

This Proposed Plan identifies the proposed remedy for the Metal Bank Site. In addition, the Plan includes summaries of other alternatives analyzed for this Site. This document is issued by the U. S. Environmental Protection Agency (EPA), the lead agency for Site activities, in consultation with the Pennsylvania Department of Environmental Protection (PADEP), the support agency. This remedy will address the long-term threat caused by the Site. EPA will finalize its selection of a remedy for the Site only after the public comment period has ended and the information submitted during this time has been reviewed and considered.

Dates to remember:
Mark Your Calendar

July 20 - August 19, 1995
Public comment period on alternatives in Proposed Plan.

July 27, 1995
Public meeting at the Disston Recreation Center
1511 Disston Street
Philadelphia, PA
7:30 PM

INSIDE

AR302608

EPA has prepared this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the ***Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)***. This Proposed Plan summarizes information that can be found in greater detail in the ***Remedial Investigation and Feasibility Study (RI/FS)*** report and other documents contained in the ***Administrative Record*** file for this Site. EPA encourages the public to review these documents in order to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted there. The Administrative Record file, which contains information upon which the final selection of the remedy will be based, is available at either of the following locations:

NE Branch of Philadelphia Library
2228 Cottman Avenue
Philadelphia, PA 19149
(215) 685-0522
Hours: Mon-Wed 10AM-9PM
Thur-Sat 10AM-5PM

U. S. EPA - Region III
841 Chestnut Building
Philadelphia, PA 19107
(215) 597-3037
Contact: Anna Butch, Administrative Record Coordinator
Hours: Mon-Fri 8:30 AM-4:30 PM

A glossary of abbreviations that may be unfamiliar to the general public is provided at the end of this Proposed Plan.

I. SITE BACKGROUND

The Site is located at 7301 Milnor Street in an industrial area of northeastern Philadelphia (see Figure 1). The Site is bordered by an orphanage (St. Vincent's School) and a mudflat on the west, Milnor Street on the north, a paper recycling company (Hancock Paper Co.) and a metal salvage yard (Morris Iron & Steel Co.) on the east, and the Delaware River on the south. There is a City of Philadelphia stormwater outfall that empties into the mudflat. There is also a marina (Quaker City Yacht Club) located west of the mudflat.

The Site consists of two areas: (a) the southern area which was used as a scrap metal recovery area, and (b) the northern area which consists of three vacant brick and steel buildings. The southern area is approximately six acres and consists of artificial fill over what was once the bed of the Delaware River.

Figure 2 illustrates the approximate location of each area that will be discussed in this document. The Southern Portion of the Site includes an Underground Storage Tank (UST) which is buried inside the ***Non-Aqueous Phase Liquid (NAPL)*** Area. The NAPL Area is an area thought to contain residual oil #1 and will be discussed in greater detail below. There are also areas containing elevated concentrations of Polychlorinated Biphenyls (PCBs) in the Southern Portion of the Site. These areas are depicted as #2 Hot Spots and will also be discussed below. Along the shoreline of the Southern Portion of the Site is the River Sediment Area. This area includes the Mudflat Area, the Riprap Area, and the Delaware River Sediment Area. The northern area contains the Building Area, the Courtyard, and a parking area.

Light Non-Aqueous Phase Liquid (LNAPL) is a condition where an oil layer, being immiscible with and #3 lighter than water, floats on top of the water table. At this Site, the LNAPL has been shown to be contaminated with PCBs. The oil layer has been observed to discharge to the river in the Mudflat Area and is believed to be the vehicle by which the PCBs enter the river and sediments. The extent of the LNAPL is depicted in Figure 2 as the NAPL Area.

#4 Evaluation of the RI/FS provided evidence that there may also be a ***Dense Non-Aqueous Phase Liquid (DNAPL)***. DNAPLs are oil layers that are heavier than water and, therefore, sink in the aquifer until

they meet an impermeable layer. DNAPLs then flow primarily by gravity. In certain subsurface soil samples, such as SB-105 and SB-106 (see Figure 3), the profiles show PCB levels that remain the same or potentially increase with depth below the water table. The presence or absence of the suspected DNAPL will be determined during the design phase of the remedy.

#5 From 1882 to 1962, the Site was owned by a power equipment manufacturer and a now-disbanded federal agency ("the War Assets Administration"). Since 1962, the Site was owned by the predecessor to Metal Bank of America, Inc., Metal Bank of America, Inc., and various principals of the corporation. In 1980, the Philadelphia Authority of Industrial Development ("PAID"), acting on behalf of the City of Philadelphia, purchased the Site from the corporate principals and entered into an installment sales contract with Metal Bank. In 1985, the Site owner ("Metal Bank") sold its assets (with the exception of the real estate at this Site and on State Road) and no longer operated as a company, and was renamed U.C.O.-M.B.A., Inc.

The buildings located in the Building Area were leased to various tenants from the 1960's to the 1980's, including an automotive dealership, a rug shampoo company, a rock salt storage company, and an automotive repair company. Manufacturing activities took place on the Site between 1882 and 1955. In 1962, the Site was used for the storage and reclamation of various scrap metals.

From late 1968 until early 1973, transformer salvage operations were conducted at the Site. Some of the transformers purchased by Metal Bank contained oil. This oil was drained on a concrete pad which was connected to an Underground Storage Tank. Spills of the oil and possibly a rupture of the tank caused soil and groundwater contamination. Between 1968 and 1972 copper wire may have also been burned to remove insulation, however Metal Bank states that oil was not burned. The following chronology highlights the enforcement activities by various governmental agencies and other cleanup activities that have taken place at this Site leading up to the present time.

DATE	EVENT
1950 - 1967	Approximately 15 feet of fill, from unknown origin, was gradually added onto a portion of the Site that was part of the Delaware River. This area is referred to here as the Southern Portion of the Site.
1972	The United States Coast Guard (USCG) investigated reports of oil seeps into the Delaware River and concluded that Metal Bank was the source. Analyses using then-available state-of-the-art technology did not detect PCBs in the oil samples. Metal Bank performed various remedial actions following the recommendations of the USCG which included cleanup of spilled oil and improved housekeeping. Metal Bank also reported that it had ceased all transformer salvaging activities.
1977	EPA retested the 1973 USCG samples using new procedures. The new analyses disclosed the presence of PCBs at concentrations over 800 ppm. The USCG, EPA, PADEP, the Army Corps of Engineers, the City of Philadelphia, the Fish and Wildlife Service, the National Oceanic and Atmospheric Administration (NOAA), the Delaware River Basin Commission, and others inspected the Site. As a result of several inspections, EPA prepared a Scope of Work with recommendations concerning remediation of the PCB problem. EPA requested that Metal Bank fulfill the Scope of Work. Metal Bank rejected EPA's Scope of Work and employed its own technical consultants who concluded that the most appropriate action was to leave the PCBs in place, removing only the freely recoverable oil.

1980	EPA filed suit in the District Court for the Eastern District of Pennsylvania for injunctive relief and costs against Metal Bank under the Resource Conservation and Recovery Act (RCRA) and the Toxic Substances Control Act (TSCA), the law that regulates usage of PCBs. During the litigation, Metal Bank's consultant designed a groundwater recovery and treatment system. The system consisted of two recovery wells and several separation units which collected the oily solids.
1981	Metal Bank reported to PADEP in 1986 that the Underground Storage Tank was drained, cleaned, and filled with concrete in 1981.
1983	EPA settled the suit with Metal Bank under a Stipulation that required Metal Bank to install and operate the groundwater recovery and treatment system until all recoverable oil was removed from the Site. However, the system did not operate between December and February because of freezing weather.
	The Site was placed on the National Priorities List (NPL) based on a Hazard Ranking System (HRS) score of 33.23. Most of this score related to the Torresdale water supply intake, which is approximately 2.1 miles upstream, and the possibility that PCBs from the Site would reach the intake due to tidal influences.
December 1987	EPA sent letters to individuals and companies notifying them that they are Potentially Responsible Parties (PRPs) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). EPA's allegations were based on invoices which indicate that the PRPs sent, either directly or through brokers, transformers and other electrical equipment to Metal Bank of America.
January 13, 1989	Metal Bank notified EPA pursuant to the Stipulation that it intended to shut down the oil recovery system, stating that all recoverable oil had been removed.
April 1, 1989	Due to the concern that PCB oil may have been burned at the Site, EPA conducted dioxin soil sampling at St. Vincent's School. The soil samples did not demonstrate a health risk problem due to dioxin.
June 12, 1989	The Court issued an Order denying a motion by the United States to prevent permanent shutdown of the recovery system. The recovery system was subsequently dismantled and removed.
	Samples from monitoring wells taken in March and August of 1989 continued to recover a floating layer of oil.
June 1991	EPA signed an Administrative Order by Consent with 10 PRPs comprising the Cottman Avenue PRP Group to conduct a Remedial Investigation and Feasibility Study (RI/FS). Metal Bank, however, declined to join the PRP Group. Most of the PRP Group are utility companies.
October 1994	The RI/FS report was submitted to EPA.
January 1995	PRPs performed additional sampling of the Delaware River Sediment Area. The results of this sampling were submitted to EPA on April 17, 1995 in a report titled "Remedial Investigation Addendum" (RI Addendum).

Historical aerial photographs have shown that most of the Southern Portion of the Site was part of the Delaware River prior to 1950. This area was gradually filled in from 1950 to 1967. Approximately 15 feet of fill underlies the Site. The fill materials contain pieces of brick, lumber, cloth, metal, and concrete along with natural earth materials (sand, silt, gravel, etc.). The United States Department of Agriculture, Soil Conservation Service (SCS) has not classified the soils at the Site and other similar areas in Philadelphia County since identification of the reworked soils here is not practical. The material beneath the fill is reportedly a stiff gray clay of low permeability which appears to be continuous with the Delaware River bottom. Since no sampling has been performed beneath this clay layer, it is not known if this material represents a divider between the fill layer and the underlying aquifer.

According to published data, the next layer under the fill, is approximately 15 feet of the Farrington Sand formation. Below the Farrington Sand formation, and approximately 50 feet from the surface of the Site, is the bedrock. The bedrock is classified as the Proterozoic rock of the Wissahickon Formation. Groundwater movements in the rock formation are through cracks and openings known as fractures and joints. Based on well records, groundwater within this formation flows towards the southeast. Several rounds of water level measurements on-site have also demonstrated that groundwater discharges through the fill into the Delaware River in a southeasterly direction.

#6 EPA has observed that during high tides, there is an increase in groundwater level while during low tide, there is a decrease. However, the exact extent of the correlation cannot be determined from the tidal monitoring performed as part of the RI/FS. Therefore, tides from the Delaware River do have a flushing effect on the contaminants in the subsurface soil and also act as a transport mechanism. Regional groundwater flow direction and flow direction during high tides are illustrated on Figure 2A.

Since the 1960's, activities at the Site have included reclamation and recycling of large electrical transformers, many of which contained PCB-bearing oils. These oils were drained from the transformers and were stored in an Underground Storage Tank (UST) near the southwest corner of
#7 the Site. In 1986, the Site owner submitted to PADEP a Registration of Storage Tanks form which stated that the UST was cleaned and filled with concrete in 1981. During the RI/FS in 1993, several anomalies were detected with a ground penetrating radar used by the PRPs. The PRP's consultant attempted to excavate a test pit to confirm the Site owner's cleanup but a concrete slab was encountered 1 foot below ground surface which prohibited further investigation. It is unknown if the tank was actually drained of all PCB fluids or if its surroundings are free from all PCB residues.

Testing of on-site soils and monitoring wells identified sporadic concentrations of PCBs that may have
#8 resulted from poor housekeeping and from seepage of oil from the Underground Storage Tank. Inside the Building Area, analyses of chip samples of stained concrete show concentrations between 1.69 to 372 parts per million (ppm) of PCBs. Analyses of soil samples show PCB concentrations up to 42 ppm at various depths (in the Southern Portion of the Site) and up to 140 ppm at the surface (in the Courtyard area). The locations of the highest observed PCB contamination have been depicted
#9 on Figure 3. Soil samples that appeared to have been stained with oil contained up to 25,000 ppm of
#10 *Total Petroleum Hydrocarbon* (TPH). Groundwater samples from on-site wells show PCB concentrations as high as 25.6 ppb in the water phase to 1,000 ppm in oil layer phase (LNAPL).

Testing of groundwater beneath the Site has shown elevated levels of Volatile Organic Compounds (VOCs), Semi-volatile Organic Compounds (SVOCs), and metals (see Figure 4 for metals). There are no patterns indicating the contamination is due to one source. This may be due to the random fill used at the Site. The Site is located in an industrial area of Philadelphia where the upgradient
11 groundwater may also contain elevated levels of contaminants. During the RI/FS, no groundwater samples were analyzed from off-site upgradient and background locations.

While no records exist, the fill material used may have been debris from demolition, construction of Interstate 95, and a variety of other urban sources. This type of debris is commonly called "urban brown", which may contain petroleum products such as asphalt, hydraulic and lubricating oil; wood treated with pentachlorophenol (PCP), copper chromium arsenate (CCA) or creosote such as in telephone poles, dock pilings and railroad ties; tires; and other materials containing metals and organic compounds.

#12 SVOCs and PCBs have also been identified in the River Sediment Areas along the shore. Samples of sediments taken at various depths along the Delaware River show concentrations up to 19.6 ppm of PCBs and 17,000 ppm of TPH. However, their distribution and concentration appear to decrease with distance from the Site. Examples of the various ranges of PCB, and metal concentrations observed during the RI/FS are illustrated in Figures 3 and 4.

II. SCOPE AND ROLE OF ACTION

#13 The proposed remedy discussed in this Proposed Plan would be the final remedy planned for the Site. The remediation objective is to address the principle threat and reduce *risk* to human health and the environment caused by the Site, consistent with the *National Contingency Plan (NCP)*. In order to

#14 achieve this objective, the selected remedy must: 1) remove and dispose of contaminants from the Site, in the Delaware River or other environments, which cause an unacceptable risk to human health, terrestrial or aquatic life; 2) provide containment and long-term monitoring of Site contaminants, which would cause an unacceptable risk to human health, terrestrial or aquatic life, if they should continue to be released into the Delaware River or other environments; and 3) mitigate unavoidable impacts to wetlands (or "waters of the U.S.") caused by implementing the Site remedy.

#15 EPA's evaluation has identified PCBs as the major contaminants of concern that are causing unacceptable risks to human health, terrestrial and aquatic life. Therefore the remediation objective

#16 requires addressing PCBs as the principal threat and risk to human health and the environment. Other contaminants of concern at the Site include metals such as arsenic, beryllium, chromium, copper, lead, and mercury; SVOC such as Methylethyl Ketone and phthalates; DDT-type pesticides; polynuclear aromatic hydrocarbons (PAHs); dioxins and furans.

The facts and health effects associated with PCBs are provided in the PCB Fact Sheet, a shaded box on page 7.

III. SUMMARY OF SITE RISKS

In August 1990, EPA issued Guidance (OSWER Directive 9835.15) requiring that all risk assessments for PRP-funded investigations such as an RI/FS are to be performed internally by agency personnel. As a result, the Administrative Order by Consent provides that the agency specialists will perform the risk assessments. EPA evaluated the risk to human health and terrestrial life, and requested assistance from NOAA to evaluate the risk to aquatic life. Each of these assessments are provided in their entirety in Appendix D of the RI/FS.

The summary below does not present all of the considerations or data discussed in the assessment, but rather the highlights that formed the conclusion. Therefore, the reader is encouraged to review the risk assessments in their entirety to fully understand all the factors considered by EPA in their evaluation of potential risks.

PCB FACT SHEET

#17 PCBs (Polychlorinated Biphenyls) belong to a broad of family of organic chemicals known as chlorinated hydrocarbons. PCBs are produced by the combination of one or more chlorine atoms and a biphenyl molecule.

Prior to 1979, PCBs were widely used in electrical equipment such as transformers, capacitors, switches, and voltage regulators for their "cooling" properties because they do not readily burn or conduct electricity, and only boil at high temperature. Also, PCBs do not readily react with other chemicals. They were also used in mining equipment, heat transfer and hydraulic systems, carbonless copy paper, pigments, and microscopy mounting media. Virtually all PCBs in existence today have been synthetically manufactured (man-made). EPA regulates PCBs through rules issued pursuant to the federal Toxic Substances Control Act of 1976. These regulations control the use, marking, storage, records, and disposal of PCBs.

When released into the environment, PCBs do not easily break apart and form new chemical arrangements (i.e., they are not readily biodegradable). Instead, they remain in the environment and are taken up and stored in the fatty tissues of all organisms. The concentration of PCBs in fatty tissue increases with time even though the exposure levels to PCBs are very low. This process is called bioaccumulation. Another problem, known as biomagnification, is that PCBs build up in the food chain. As living organisms containing PCBs are eaten by other organisms, the amount of PCBs consumed by each higher organism increases. The concentration consumed by humans, at the end of the food chain, can thus be significant.

Laboratory data show that PCBs cause cancer in animals. Although there are no actual data showing that PCBs cause cancer in humans, EPA's policy is to consider animal carcinogens to be possible human carcinogens. Animal studies show adverse reproductive and developmental effects from repeated exposure to PCBs. In addition, it has been shown that PCBs are toxic to fish at very low levels of exposure. The survival rate and the reproductive success of fish can be adversely affected by the presence of PCBs. EPA believes there may be similar cause for concern when humans are exposed to large doses of PCBs. Exposure to PCBs can cause chloracne (a painful, disfiguring skin ailment), liver damage, nausea, dizziness, eye irritation, and bronchitis.

The dangers of toxic doses of PCBs were dramatically and tragically brought to the world's attention in 1968, when some 1,300 people in Yusho, Japan, used rice oil that had been accidently contaminated with PCBs leaking from a heat exchanger. The victims developed a variety of ailments characterized as "Yusho Disease". These symptoms include skin lesions, eye discharges, abdominal pain, menstrual irregularity, fatigue, cough, disorders of the nervous system, hyperpigmentation of the skin, nails and mucous membranes. And although precise figures are not yet available, there is evidence that there was an increased rate of cancer among the Yusho victims who have died since 1968. As a result of the Yusho tragedy, the Japanese government virtually banned the production, import or export of PCBs in 1972.

PCB contamination has also taken its toll in the United States. Measurable amounts of PCBs can be found in soils, water, fish, milk, and human tissue. Some fish in the Hudson River, the Great Lakes and other water bodies are too contaminated with PCBs for human consumption. There is a fish advisory in the Delaware River due to PCB contamination in Delaware River fish.

Other by-products that are much more toxic than the PCBs themselves occur when PCB oil or its dielectric fluid is partly burned. The PCB fluid produces polychlorinated dibenzodioxin and polychlorinated dibenzofurans. Tests on rats show that furans can cause anemia and other blood problems. Dioxin is associated with a number of health risks, and has been shown to cause cancer of the liver, mouth, adrenal gland, and lungs in laboratory animals.

III.A. Human Health Risk Assessment

#18 EPA identifies potential human health risk by estimating a carcinogenic risk level and a non-carcinogenic hazard index. For example, a $1x10^{-6}$ level means that there will be, at the most, one chance in 1,000,000 that an individual will develop cancer above the expected rate for the normal population (which is 1 in 4) as a result of Site-related exposure. EPA's position is that risk must be at a level less than $1x10^{-4}$, one chance in 10,000, to be acceptable; however, risk levels between $1x10^{-4}$ and $1x10^{-6}$ may also prompt EPA to take remedial action. Remedial Action is generally warranted when the carcinogenic risk levels exceed $1x10^{-4}$.

The hazard index identifies the potential for the most sensitive individuals to be adversely affected by non-carcinogenic chemicals. If the hazard index exceeds one (1), there may be concern. As a rule, the greater the value is above 1, the greater the level of concern. Changes in the hazard index, however, must be one or more orders of magnitude (e.g., 10 times greater), to be significant.

The principal results of the Human Health Risk Assessment are summarized as follows:

1. *OFF-SITE RESIDENTS*: Cancer risk associated with inhalation of Site dust was estimated to be $2x10^{-6}$. The Hazard Quotient could not be calculated since none of the contaminants had inhalation reference doses. Therefore, the Site does not pose an unacceptable risk to *Off-Site Residents*.

2. *RECREATIONAL FISHERMEN (BOATERS)*: Lifetime cancer risk associated with eating fish fillets that contain PCBs ($4x10^{-4}$) and chance ingestion of sediments containing PCBs ($1x10^{-5}$) was estimated to total $4x10^{-4}$. Although PCB levels in fish tissues may be due to sources other than the Site, contamination in the nearby sediments, especially in the Riprap Area, appears to be Site-related. PCB concentrations in the Riprap Area (see Figure 3) were as high as 19.6 ppm, as previously mentioned. Therefore, the Site poses an unacceptable risk, through the Riprap and sediments, to *Recreational Fishermen (Boaters)* who eat 10 meals a year of fish caught near the Site. #19

3. *FUTURE INDUSTRIAL WORKERS*: Cancer risk associated with future employees who work at the Site on a regular basis was estimated to be $7x10^{-5}$. The majority of the risk was attributed to chance ingestion of soil contaminated with PCBs in the Courtyard. Chance ingestion may occur when an individual eats food with hands that have been in contact with contaminated soils.

   The presence of arsenic, beryllium, and chromium in surface soils also contributed to the risk outside of the Courtyard but EPA acknowledges that these are trace amounts and may represent background levels for the area. Nevertheless the Courtyard surface soils pose an unacceptable risk to *Future Industrial Workers*.

4. *FUTURE CONSTRUCTION WORKERS*: Cancer risk associated with construction workers such as cleanup contractors who spend one year working at the Site was estimated to be $6x10^{-3}$ assuming no protective precautions were in place. The high cancer risk originated from two sources: (1) workers coming into contact with PCBs found in the oil layer of groundwater sampled in monitoring well MW#6, which is located in the NAPL Area; (2) ingesting polynuclear aromatic hydrocarbons (PAHs), and dioxins and furans found in the subsurface soils. Since the reasonable maximum concentration of dioxins and furans was only 4 ppb and the risk was only $5x10^{-6}$, this contaminant's risk was considered to be relatively minor compared to those associated with PCBs. Therefore the PCB oils floating in the groundwater poses an unacceptable risk to *Future Construction Workers*. #21

5. *SCENARIOS NOT EVALUATED*: EPA did not consider *FUTURE RESIDENT ON-SITE* because residential use of the Site would be unlikely on the basis of population trends in the area, current land use, and future land use plans of the City of Philadelphia. EPA also did not consider *FUTURE GROUNDWATER INGESTION ON-SITE* since it is unlikely any future commercial tenants of the property would drill wells when city water is available. Finally, EPA did not consider *HYPOTHETICAL ADOLESCENT TRESPASSERS* because the *FUTURE INDUSTRIAL WORKER* scenario was similar and more conservative.

III.B. Terrestrial Risk Assessment

#22 The Terrestrial Risk Assessment evaluated the impacts from contaminants found in the Site media (i.e., Groundwater, Soil, Surface Water, Mudflat and Riprap) to land animals such as muskrats, ducks, and birds as well as the organisms (i.e., worms and snails) which they feed upon. The possibility that a certain contaminant in a Site medium would have an impact was expressed as the Environmental Effects Quotient (EEQ). EEQs were calculated for each Site contaminant in each Site medium by dividing the maximum concentration of the contaminant found or its statistical derived concentration known as the 95% Upper Confidence Limit Value by the Environmental Effects Criteria (EEC), which provides a measure of the impact of a given amount of the contaminant on the species in question. Since no testing has been done on animals at the Site, EEC values were obtained from published research papers. Any contaminant in a medium that had an EEQ greater than one (1) was considered to present an unacceptable risk and labeled as a Contaminant of Concern (COC). Any area (medium) that demonstrated EEQ values that collectively exceeded 10 was considered to be of high terrestrial risk. Table 1 presents the EEQ value of the contaminants that cause a risk in the different areas on the Site.

The principal results of the Terrestrial Risk Analysis may be summarized as follows:

1. *GROUNDWATER*: Total EEQ values were approximately 1000 and ranked by contaminants in
#23 the metals and pesticides group. Since the only possible exposure of terrestrial organisms to groundwater is when it enters into the *SURFACE WATER* through seeps, evaluation of that medium was reserved for the Aquatic Risk Assessment. The Aquatic Risk Assessment
#24 calculated that when the groundwater reaches the surface water, it is diluted in the Delaware River by several magnitudes such that all contaminants, except PCBs, will not pose a threat to aquatic organisms in the Delaware River. Therefore metals and pesticides in the groundwater do not pose an unacceptable risk to the terrestrial environment. Furthermore with the installation of Subsurface Trenches and Oil-water Separators, to be described below in Section IV.3., all uncontrolled seeps into the river would be eliminated.

2. *SOIL*: The total EEQ value for soils inside the Courtyard was not calculated because no contaminant's EEQ exceeded one. The only contaminant that exceeded one outside the Courtyard was Methylethyl Ketone (an SVOC). The only possible exposure route would be through deep rooted vegetation in the subsurface soil. Risk associated with this contaminant would be very low.

3. *SURFACE WATER*: EEQs were not calculated for this medium since this evaluation is related more to the aquatic environment and reserved for the Aquatic Risk Assessment. See Section III.C. below.

4. *MUDFLATS*: EEQs in the mudflat beyond the Site totalled 150 and were due to PCBs and
#25 DDT-type pesticides. The impact of contamination was projected to be a loss of small organisms living in the river bottom rather than the animals higher in the food chain.

   EEQs in the Mudflat Area were calculated to total 300 due to PAHs from the SVOC group and DDT-type pesticides.

5. *RIPRAP*: The total EEQ values approached 20,000 and were due to PCB and several PAHs.

In conclusion, the Terrestrial Risk Assessment found that the Mudflat and Riprap Areas posed a
5 serious risk since they contain several contaminants (such as PCBs, PAHs, and pesticides) which may affect an assortment of vegetation as well as the land creatures that feed and reproduce there.

III.C. Aquatic Risk Assessment

The Aquatic Risk Assessment was conducted to evaluate risks to the environment associated with the Delaware River. The assessment was organized into sections considering the following subjects:

1. *Fish and Other Aquatic Organisms:* Of primary concern was the Shortnose Sturgeon, a #27 freshwater fish designated as an endangered species by Federal and Commonwealth of Pennsylvania regulations (see 50 CFR §17.11-12 and 58 PA Code Chapter 75, Section 75.1-2305b.). The Shortnose Sturgeon spends its entire life cycle in the Delaware River. The channel catfish was used as a surrogate for the assessment of the potential exposure of endangered sturgeon to PCBs, since no recent data were available on tissue PCB concentrations in sturgeon.

2. *Contaminants of Concern*: PCBs were identified as the primary contaminant of concern #28 because of (a) elevated concentrations in groundwater, NAPL, and sediments; and (b) their high potential for bioaccumulation in aquatic organisms. However, the impacts of other contaminants, including PAHs and phthalates were evaluated for the Aquatic Risk Assessment.

3. *Exposure Pathways*: This section evaluated the potential routes of exposure of aquatic organisms to contaminated media and estimated exposure-point contaminant concentrations #29 for each pathway. For the assessment of exposure to PCBs and PAHs in mudflat and river sediment adjacent to the Site, the area was divided into three zones. These divisions showed a clear pattern of decreasing concentration with distance from the Site boundary. The zones grouped for evaluation were (a) the Riprap Area; (b) the Mudflat and Delaware River within 30 meters of the Site boundary; and (c) the Mudflat and Delaware River greater than 30 meters away from the Site boundary.

4. *Toxicity*: The toxicity section determined concentrations of the contaminants of concern in the different media that can be used to assess the potential for risk to aquatic organisms due to #30 exposure to such contaminants in the environment. Since no Site-specific testing or biological effects assessments were conducted, this assessment was based entirely on published information.

5. *Risk Characterization*: The risk characterization section used the hazard quotient method to integrate the results of the exposure assessment and the toxicity assessment and to develop an estimate of the level of risk from the estimated exposure-point contaminant concentrations for each medium. A hazard quotient represents the ratio of the estimated exposure-point contaminant concentration for a contaminant of concern to its toxicity reference concentration. Potential risk is presumed to exist if a hazard quotient is greater than one (1). However, in order to fully characterize the risk, it is necessary to evaluate each organism's frequency and duration of exposure.

The results of the hazard quotient assessments and the risk characterization for the contaminants of concern in each exposure pathway are outlined in Table 1 and are as follows:

1. *SURFACE WATER & GROUNDWATER* - Based on a screening evaluation which compared the maximum measured concentration (adjusted for dilution by the Delaware River) of potential contaminants of concern in groundwater to chronic toxicity values, only PCBs were further #31 evaluated as contaminants of concern in the surface water. The hazard quotient based on chronic exposures for the Shortnose Sturgeon was greater than one, indicating possible risk. However, it was considered highly unlikely that individual Shortnose Sturgeon would remain in

the exposure area long enough to receive chronic exposure. PCB concentrations in surface water in the Delaware River (estimated from dilution of maximum groundwater concentrations) were not expected to result in chronic toxicity to most fish species. However, the discharge of PCBs in the groundwater into the Delaware River will contribute to PCB accumulation in nearshore food webs. This means that PCBs contribute to an unacceptable risk if they are not prevented from migrating into the groundwater and eventually discharging into the surface water.

2. *NON-AQUEOUS PHASE LIQUID (NAPL)* - Any exposure to NAPL, if it occurs, is likely to be localized in the immediate vicinity of the Riprap Area. Because measured concentrations of
#32 PCBs, PAHs and phthalates in NAPL exceeded toxicity reference concentrations by as much as five orders of magnitude, direct toxic effects to exposed organisms are highly probable. Any discharge of PCB contaminated NAPL would also contribute to PCB accumulation in nearshore organisms and food webs. Therefore, an unacceptable aquatic risk exists due to PCBs, PAHs and phthalates in the NAPL Area.

3. *MUDFLAT AND RIPRAP AREAS* - The primary route of exposure for organisms in the Delaware River and the mudflat are through ingestion and contact with (1) sediments from the shorelines and (2) water ponded around these sediments. The highest levels of PCB and
#33 PAH contamination in sediments are restricted to a relatively small area immediately adjacent to the Site. Mean sediment concentrations of PCBs and PAHs greatly exceeded probable effects levels in the Riprap Area, indicating that adverse effects to organisms exposed to these contaminated sediments are highly likely. Concentrations of PAHs and phthalates decreased in a steep gradient away from the Site, resulting in hazard quotient values that were one or less in the mudflat and Delaware River farther than 30 meters from the Site Boundary. Hazard quotients for PCBs exceeded 1 for all three zones, ranging from over 400 in the Riprap to less than 5 in the outer zone. Therefore, an unacceptable aquatic risk exists in the sediments associated with the Riprap due to PCBs and PAHs, and the degree of risk declines with distance from the Riprap Area into the Mudflat Area.

4. *DELAWARE RIVER SEDIMENT AREA* - Due to the limited sampling of Delaware River sediment, the extent of PCB contamination was not adequately defined and could extend both
#34 downstream and upstream of the Site, although concentrations appear to decline rapidly with distance from the Site Boundary. Limited data are available for contaminants other than PCBs and PAHs. Problems with data quality (high detection limits for PCBs and other contaminants) further increase the uncertainty in the exposure-point concentrations and the size of the exposure area. Therefore not enough information is available to determine if PCB concentrations and other contaminants of concern in sediments in the Delaware River adjacent to the Site represent an unacceptable degree of risk to aquatic organisms.

In January 1995, additional samples were taken in the Delaware River Sediment Area. The result showed low concentrations of PCBs nearshore while several points (DR8, S7, S9) indicated a streak of PCB contamination that was above cleanup levels as far as 90 feet from the Site (see Figure 3). No samples were available beyond these points. To that degree, the additional sampling did not conclusively identify the extent of PCB contamination.

5. *THE SHORTNOSE STURGEON* - Considerable uncertainty exists in estimating the extent of exposure for the endangered sturgeon. In addition, little is known about its relative sensitivity
#35 to adverse effects from accumulation of PCBs. Although it occupies a lower level in the food chain than channel catfish, the Shortnose Sturgeon may be particularly prone to accumulating and transferring high concentrations of PCBs to their developing offspring (considered the most sensitive toxic endpoint for PCBs for fish) due to their bottom feeding habit, longevity, late age of sexual maturity, and high lipid content of their eggs. Therefore, the potential risk to

Shortnose Sturgeon resulting from accumulation of PCBs from all exposure pathways near the Site may be greater than for other fish species. In most fish, other contaminants such as PAHs are rapidly metabolized and excreted.

#36 IV. SUMMARY OF ALTERNATIVES

Based on the results of the risk assessment, five (5) remedial alternatives were developed and evaluated to address the risks posed by the Site to human health and the environment. The first alternative is a "no action" alternative. This alternative provides a baseline to which the other alternatives can be compared. The other four (4) alternatives provide for various degrees of cleanup and protection. Each alternative specifies remedial actions to be taken with respect to the following areas at the Site:

1. Building Area (including the Site Boundary)
2. Courtyard
#37 3. River Sediment Areas (including the Mudflat, Riprap and Delaware River Sediment Areas)
4. Southern Portion of the Site (including the NAPL Area, the Hot Spots and the Underground Storage Tank)
5. Groundwater

A summary of all five (5) remedial alternatives developed for the RI/FS in addition to EPA's proposed remedy, which is a combination of components from the other alternatives, is presented in Table 2. The construction costs and the operation and maintenance costs for 30 years were estimated to give the ***present worth*** of total costs for each alternative. The clean-up level for each area of the Site is
#38 presented in Table 1. A schematic drawing depicting the remedy for each area is presented in Figure
#39 2A.

#40 Details of the Proposed Alternative (Alternative C-7A)

While Remedial Actions in the Building Area, the Courtyard and the groundwater may be performed independently, construction in the River Sediment Areas and the Southern Portion of the Site would be sequenced in order to minimize disturbances and avert potential releases of contaminants into the adjacent Delaware River environment. The schedule of Remedial Actions in the River Sediment Areas and the Southern Portion of the Site are as follows: (1) install a temporary Sheet Pile Cofferdam; (2) install a permanent Sheet Pile Wall and Oil-water Separators along the Site's riverbank; (3) remove an Underground Storage Tank and PCB Hot Spots; and (4) remove the contaminated sediments in the River Sediment Areas.

EPA's proposed remedy is Alternative C-7A and is described in greater detail below. This alternative represents a combination of several components of Alternatives C-5, C-7, C-8, and C-12. Approximate physical dimensions of various components are included solely to facilitate understanding and evaluation of the proposed alternative. Actual dimensions, as well as other specifics of design and construction and maintenance, will be identified during the Remedial Design, following final selection of a remedy and the issuance of a ***Record of Decision (ROD)***.

1. The Building Area (including the Site Boundary)

A perimeter fence would be installed around the Site Boundary to restrict access and to prevent potential contact by trespassers as well as protect any control systems that may be installed as part of the remedy. Warning signs would be placed to warn local citizens about the hazards present at the

Site. Deed restrictions would be imposed to control future use and curtail development of the Site that may be adverse to the remedy.

No action would be taken within the Building Area since the Human Health Risk Assessment indicated that the risk within the building was $4x10^{-4}$, a level which does not warrant action (see Table 1). Furthermore, the perimeter fence restricts the public from being in contact with the PCB contamination inside the Building Area and the contamination is not mobile.

2. Courtyard

#42 The Human Health Risk Assessment identified PCBs in the surface soil as a potential health hazard to *Future Industrial Workers* at the Site (Cancer risk = $7x10^{-5}$). Therefore all surface soil exceeding 10 ppm PCB would be excavated and disposed off-site at a licensed facility.

3. River Sediment Areas (including the Mudflat, Riprap and Delaware River Sediment Areas)

Sediments that exceed 1 ppm PCB or 32 ppm PAHs would be excavated from these areas. The excavated sediments containing up to 25 ppm PCBs would then be staged as fill for Hot Spots which would be removed within the Southern Portion of the Site. This process will be described below. Sediments that exceed 25 ppm PCB would be dewatered, separated and disposed off-site at a
#43 licensed facility. Oversized materials such as boulders would be decontaminated and reused as Riprap while unsuitable debris would be disposed off-site. All excavated areas would be restored with clean fill.

Prior to excavation of the Hot Spots, a permanent Sheet Pile Wall would be installed along the riverbank of the Site to prevent fill materials located in the Southern Portion of the Site from sliding into the river. Figure 2A illustrates its approximate location.

EPA anticipates that some residual contamination may remain after remediation of PCB Hot Spots, therefore EPA proposes a containment system consisting of Subsurface Trenches and Oil-water Separators to be installed along the riverbank of the Site (as part of the permanent Sheet Pile Wall). This system would collect and separate the floating PCB-contaminated oils that are being discharged
#44 with the groundwater. Groundwater would pass underneath the trenches and be allowed to flow into the Delaware River. All collected oils would be disposed off-site at a licensed facility.
Due to the concerns expressed above regarding DNAPLs (see page 2), the system would be designed to collect and remove any DNAPL discovered during the Remedial Design phase. This system must have the ability to be modified in order to actively collect DNAPLs before it reaches the Mudflat or any other River Sediment Areas. Such a system may include sump pumps in combination with the proposed Oil-water Separators.

Before excavating the River Sediment Areas, a temporary Sheet Pile Cofferdam would be installed along the Mudflat and the Delaware River Sediment Areas. This would enable contaminated sediments to be excavated and dredged without stirring up other sediments in the Delaware River and prevent contaminated sediments from moving into less contaminated areas. The exact area and depth of the sediments to be removed cannot be determined from the data collected during the
#45 January 1995 sampling effort. EPA will perform additional sampling during the Remedial Design. The final alignment of the temporary Sheet Pile Cofferdam will be determined by this additional sampling. Presently, the removal of contaminated sediments would be implementable near the shorelines where land-based excavation equipment can be utilized. The Delaware River is an area characterized by strong currents and water depths of 7 to 10 feet during low tide within 300 feet from the shoreline. Any removal of sediments beyond that distance would be more difficult and significantly more expensive.

#46 4. Southern Portion of the Site (including the NAPL Area, the Hot Spots and the Underground Storage Tank)

The RI/FS identified an area that is saturated with oil as the NAPL Area and concluded this is the sole source of PCB contamination to the Delaware River from the Site. EPA believes that the Hot Spots, as discussed below, may also contribute to PCB contamination in the Delaware River.

#47 The Human Health, Terrestrial and Aquatic Risk Assessments all have concluded that there is a threat to river sediments and organisms living in the Delaware River from Site-related PCBs and other contaminants of concern. PCBs may migrate into the river when rainwater, groundwater or tides from the Delaware flush the PCB-contaminated soils underneath the Site. If the contaminated river sediments are removed, they could be contaminated again because there are source areas within the Site that contain levels of PCBs above 25 ppm. These source areas are called Hot Spots and will present a continuous threat if they are not removed from the Site. As the first step, EPA proposes to sample and remove a suspected leaking Underground Storage Tank. The standard for removing and disposing of contents associated with the leaking tank normally would be 50 ppm PCBs. However EPA is proposing a clean-up standard of 25 ppm PCBs in order to be consistent with the Hot Spot removal standards since they are all located in the same area. Contaminated materials would be disposed of off-site at a licensed facility in accordance with federal PCB Storage and Disposal regulations (40 CFR 761.60).

To further delineate the Hot Spots within the Southern Portion of the Site, EPA proposes to resample the area in a thorough and methodical grid pattern. Final designation of the Hot Spots and the soils to be remediated would be based on this additional sampling. Based on the fragmented data that produced a subsurface soil profile for the RI/FS, EPA anticipates the Hot Spots to be less than 18 feet deep and located in 3 major areas as illustrated on Figure 2A. Hot Spot soils contaminated with PCB levels exceeding 25 ppm would be excavated and disposed of off-site at a licensed facility. This would be consistent with the TSCA PCB management policy for non-residential soils.

PCB contaminated sediments from the Mudflat, Riprap and the Delaware River which exceed 1 ppm PCBs but are less than 25 ppm PCBs would be used as fill for the excavated Hot Spots. The sediments approved for fill would not require further treatment.

#49 Once the Hot Spots are removed and the voids are backfilled, a soil cover would be constructed over the entire Southern Portion of the Site to insure proper drainage of rainwater and surface water and minimize erosion of the Site fill. Finally, Site restoration would also include specific measures to promote wildlife habitat diversity. These aspects would be detailed in the Remedial Design.

5. Groundwater

#50 Although the groundwater beneath the Site contains an array of elevated VOCs, SVOCs, and metals, the risks attributed to these contaminants in the groundwater were estimated to be low. Since the aquifer beneath the Site is designated as a Class III aquifer, which is currently not a source of drinking water and will not likely be in the future, human health risks cannot be attributed to the groundwater contamination. Since the level of groundwater contamination and the potential for off-site migration will decrease following the removal of Hot Spots, EPA proposes no groundwater remediation.

51 After the removal of the PCB Hot Spots, a monitoring program will be implemented to assure that PCB residual contamination discharging from the Site, in the form of groundwater or leachate, into the Delaware River does not cause an exceedance of the chronic ambient water quality criteria (AWQC) value of 0.014 ug/l (ppb). The monitoring program would also include sampling of liquids collected in the Oil-water Separators from both the LNAPL and potential DNAPL phases as discussed previously. This program is anticipated to monitor chemicals sampled during the RI/FS, which include PCBs, TCL

VOCs/ SVOCs, TAL metals, and groundwater chemistry parameters. It is anticipated that the
#52 monitoring program may also include wells upgradient and outside of the Metal Bank property boundaries in order to determine actual background levels of groundwater contamination. During Remedial Design, an investigation would also be performed on the lower groundwater aquifer to determine whether DNAPLs are discharging into the Delaware River or to the Torresdale water intake.

To assure that the remedy remains protective of aquatic life in the Delaware River, the long-term
#53 monitoring program which includes sampling of biological specimens and other parameters, will be developed during the Remedial Design.

V. EVALUATION OF PROPOSED ALTERNATIVE

#54 Among the alternatives considered, alternative C-7A best meets the requirement set forth by the nine (9) criteria that EPA uses to evaluate alternatives. This section analyzes the proposed alternative with regard to the nine (9) criteria. A glossary of the nine (9) criteria is provided in the shaded box on the next page. A summary of the evaluation of all remedial alternatives considered with respect to the nine (9) criteria is presented in Table 3.

Overall Protection of Human Health and the Environment. Alternative C-7A provides protection of
#55 Human Health and the Environment by restricting access to the Site with a security fence and removing the Hot Spots of contamination and a suspected leaking Underground Storage Tank in the Courtyard and Southern Portions of the Site, thereby reducing the potential for direct contact exposure to the contaminants.

Contaminated sediments will be removed from the river habitat and replaced with clean fill. The major
#56 sources of river contamination will be removed, and any residual contamination will be intercepted by the Oil-water Separator and the Permanent Sheet Pile Wall. To assure that the groundwater reaching the Delaware River causes no harmful impacts, a sampling program will be instituted.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs). The following are
#57 highlights of laws and regulations which EPA must consider when implementing the proposed remedy for the Site.

The Land Recycling and Environmental Remediation Standards Act ("Land Recycling Act"), effective in Pennsylvania on July 18, 1995, establishes alternative cleanup levels for contaminated Site media, other than the "background" standard previously required by the Pennsylvania Hazardous Waste Management Regulations. Alternative cleanup standards, other than background, include statewide standards (to be developed) and site-specific, risk-based standards. Background is redefined as the "concentration of a regulated substance...that is present at the Site, but is not related to the release of regulated substances at the Site." However, since no samples were taken of upgradient and off-site wells, it cannot be conclusively shown that levels of any contaminants in Site groundwater were due to existing background contamination in the industrial area.

The Resource Conservation and Recovery Act (RCRA) and its implementing regulations include standards for closure of Underground Storage Tanks (40 CFR Part 280, Subpart F&G). Relevant guidances (such as the Spill Policy and PADEP's "Closure Requirements for Underground Storage Tank Systems, December 1993") recommends off-site soil disposal of tank-related contaminants at 25 ppm PCBs and TPH values on a site-specific basis. Appendix A of the FS evaluated and recommended disposal of contaminants at 10,000 ppm TPH.

The Toxic Substances Control Act (TSCA) and its implementing regulations, specifically 40 C.F.R. Part 761, establish the requirements for the manufacturing, processing, distribution in commerce, use,

disposal, storage and marking of PCBs and PCB-contaminated items that contain concentrations of greater than 50 ppm PCBs. The disposal of PCB-contaminated soil and debris landfilled after February 17, 1978, that are greater than 50 ppm PCBs, is subject to the requirements of 40 C.F.R. Part 761, Subpart D. In this case, where the PCBs were deposited on the Site between 1968 and 1973, the disposal regulations in Subpart D are "relevant and appropriate". The decontamination standards set forth in the PCB Spill Cleanup Policy ("the Spill Policy"), 40 C.F.R. Part 761, Subpart G, applies to all spills that occurred after May 4, 1987. However, #58 when a cleanup is performed of a pre-1987 spill, the policy can also be used. However, the Spill Policy, which is a "to-be-considered" ("TBC") for Superfund purposes can be used to provide guidance for cleanup of spills that occurred pre-1987. More stringent risk-based cleanup levels may apply to a cleanup when spills have occurred in environmentally sensitive areas such as a body of water, a drinking water aquifer, or grazing lands for animals.

EPA has considered the Spill Policy (40 CFR 761.120 - 761.135, Subpart G) and the EPA guidance document entitled "Guidance on Remedial Actions for Superfund Sites with PCB Contamination" (EPA/540/G-90/007, August 1990) in its determination of cleanup levels. The recommended cleanup standard for PCBs in the subsurface soil, under these guidances, are: (a) 25 to 50 ppm for industrial or other reduced access areas; and (b) 0.1 to 10 ppm for residential areas. However the guidances allows flexibility when formulating cleanup levels based on risks.

GLOSSARY OF EVALUATION CRITERIA

Threshold Criteria:

- Overall Protection of Human Health and Environment - addresses whether a remedy provides adequate protection and describes how risks are eliminated, reduced, or controlled.
- Compliance with ARARs - addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of environmental statutes.

Primary Balancing Criteria:

- Long-Term Effectiveness and Permanence - refers to the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals are achieved.
- Reduction of Toxicity, Mobility, or Volume Through Treatment - refers to the anticipated performance of the treatment technologies a remedy may employ.
- Short-Term Effectiveness - addresses the period of time needed to achieve protection and any adverse impacts on human health and environment that may be posed during the construction and implementation period until cleanup goals are achieved.
- Implementability - refers to the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.
- Cost - includes the present value of estimated capital, operation and maintenance costs.

Modifying Criteria:

- State Acceptance - indicates whether, based on its review of the backup documents and Proposed Plan, the State concurs with, opposes, or has no comment on the preferred alternative.
- Community Acceptance - will be assessed in the Record of Decision following a review of any public comments received on the RI/FS report and the Proposed Plan.

With respect to the Human Health Risks, EPA recognizes that there is a day care center (St. Vincent's School) adjacent to the Site, which also serves as permanent residence to approximately 84 orphans. EPA's Human Health Risk Assessment concluded that the dangers of PCBs at the Southern Portion of the Site occurs only when people touch the contamination. However, since the PCBs are deep within the subsurface soil, skin contact is nearly impossible. This combined with other physical barriers such as a perimeter fence and a soil cover, will further eliminate human access to the PCB contamination. Since the Site is surrounded by other industrial facilities, EPA considers a PCB cleanup level of 25 ppm to be appropriate.

With respect to the Terrestrial and Aquatic Risk Assessments, EPA acknowledges that fish and other aquatic organisms do not recognize access restrictions and that the PCB migration has been observed through the groundwater. However, EPA is confident that after the removal of PCBs greater than 25 ppm, the monitoring programs will demonstrate residual PCB contamination leaching beyond the Oil-water Separators will not cause an exceedance of the chronic ambient water quality criteria (AWQC) value for freshwater aquatic life. The AWQC value of 0.014 ug/l (ppb) PCB is a requirement

established by the Clean Water Act. It is necessary because fish and other aquatic organisms are more sensitive than humans since they are directly ingesting the PCB contamination.

EPA has evidence that PCB contamination inside the Building Area is as high as 372,000 ug/100 cm^2 (or 372 ppm/100 cm^2). This measurement was derived by grinding up a chunk of the stained building material and extracting the oil in order to measure the PCB concentration. The Human Risk Assessment had assumed that a risk occurs when a worker eats 1.67 mg (0.00000367 pounds) of PCB contaminated building dust daily for 250 days in a year. Concrete chips containing visible oil stains were sampled and the stained surfaces accounted for less than 10% of the Building Area. Therefore, EPA assume that a worker would only have 10% of the Building Area to be exposed to. EPA considers its assumption to be adequately protective of human health since ingestion risk at the Site takes into account the entire Site and not just the Building Area. EPA's calculated cancer risk under this assumption was $4x10^{-6}$. EPA considers PCB levels in the Building Area not to be a threat to human health.

EPA has considered the Spill Policy as it relates to the Building Area. The Spill Policy requires industrial areas of low-contact, indoor, and impervious solid surfaces, such as electrical substations, to be decontaminated to 10 ug/100 cm^2 (or 0.01 ppm/100 cm^2). However, since the Building Area is comprised of non-impervious surfaces, the exposure to workers coming in contact with the contamination is lower than is it would be if the PCBs were not absorbed by the surfaces. The high concentrations of PCBs were derived from a different sampling method than that assumed under the policy (see above). Therefore, the concentration derived from the sampling cannot be relied on to indicate the need for cleanup in the Building Area. At this time, EPA believes that the low risk calculated in the Human Health Risk Assessment justifies leaving the Building Area as is.

EPA proposed amendments to 40 CFR 761.61 (proposed on December 6, 1994 in 59 Federal Register 62788 - 62875) and will include this regulation as an ARAR if it becomes law at the time EPA issues its Record of Decision.

The Clean Air Act (CAA) and its implementing regulations are applicable concerning emissions of dust and particulates during activities such as dredging of the contaminated River Sediments or the removal of Hot Spots. To prevent air pollution during remediation, designs must utilize the Best Available Technology (BAT) as established by the Pennsylvania Air Pollution Control Act and Regulation (25 PA Code Chapter 127.12(a)(3) - (8).

The Endangered Species Act of 1973 mandates protecting fish and other species threatened with extinction. Since the Aquatic Risk Assessment concluded PCBs of greater than 1 ppm and 32 ppm PAHs pose an unacceptable risk to the Shortnose Sturgeon, removal of contaminated River Sediments based on that standard is required.

Section 311 of the Clean Water Act (CWA) prohibits the discharge of oil into navigable waterways. Consequently, oil in the Oil-water Separator must be prevented from entering into a navigable waterway such as the Delaware River. With regard to groundwater contaminants other than PCBs, which will be removed by the Oil-water Separator, EPA believes that these contaminants will not have any adverse impact on aquatic life, taking into account the dilution effect of the Delaware River.

Other regulations that were considered include Executive Order 11988, regarding Floodplain Management, since a portion of the Site is expected to be under 10 feet of water during a 100-year
#59 flood. To prepare for the detrimental effects of flooding water on the Site, the Remedial Design must build in safeguards that would prevent the 100 year flood from entering into the Building Area and mobilizing unremediated PCBs. Also, excavation and off-site disposal of PCB Hot Spots will prevent an overwhelming migration of PCBs from re-entering the river.

The remedy must comply with Executive Order 11990, May 1977, which requires federal agencies to take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. Following the excavation of PCB contaminated river sediments, the remedy will require impacted areas be restored with clean fill.

#60 **Long-term Effectiveness and Permanence.** Removal of the Courtyard soils and the Underground Storage Tank would eliminate the environmental impact from PCB contamination. Any soil cover or restrictions placed on the Southern Portion of the Site or the Building Area must be inspected and maintained periodically to ensure its effectiveness. Also the permanent Sheet Pile Wall must be inspected periodically for rusting and corrosion.

Although various organic and inorganic contaminants would remain in the Southern Portion of the Site after Alternative C-7A is implemented, they do not generate a risk to human health or the environment. Future land use may include enterprises that do not expose the environment or people to PCB contamination that remain in the Building Areas or to other contamination in the subsurface soils.

Additional containment measures such as the Oil-water Separators along the Delaware River would act as monitoring points and as contingencies to ensure the effectiveness of the remedy if residual PCBs exist.

Reduction of Toxicity, Mobility, or Volume Through Treatment. Contamination inside the Building Area was found on and in the concrete floors. Its volume and toxicity would not be reduced. As long as the building's structure remains intact, the contamination will not be mobilized by elements such as rainwater or fire.

Since alternative C-7A does not involve treatment of the contaminated soil prior to off-site disposal, there is no on-site reduction of toxicity, mobility or volume of those materials. Treatment of the soil may occur at the licensed disposal facility. Since the soils and sediments removed would be replaced with clean fill, the volume and mobility of the overall contamination at the Site would be reduced.

#61 **Short-term Effectiveness.** Restoration of the River Sediment Areas and soil cover may require that a large amount of soil is brought onto the Site. This may result in an increase of truck traffic and generation of dust during construction. Dust suppression measures such as watering down the soil would be required.

Excavation of the Hot Spots and the River Sediment Areas could cause contaminated dust to be generated. Dust control devices such as fume hoods and other filters would be added onto the equipment in order to minimize the risk to the community. The same measures would apply to preparing the Courtyard soils for off-site disposal.

Dredging of the River Sediment Areas could cause temporary displacement of solids suspended in the Delaware River. By using a temporary Sheet Pile Cofferdam or other sediment control techniques, the turbidity caused by dredging can be minimized. The entire remedy could be in place in 2 to 4 years after Remedial Design.

#62 **Implementability.** Alternative C-7A is made up of components that are readily implementable. Excavation and off-site disposal for the Hot Spot soils is a proven technology. Unlike the excavation and disposal of the entire NAPL Area contemplated in the RI/FS, EPA anticipates that the lesser volume of soil contained in the Hot Spots can be accepted at a single facility. EPA investigation indicates that the CERCLA and TSCA approved disposal facility that is capable of accepting the estimated volume from the Site is Model City, New York, located in within 400 miles of the Site.

Excavation and backfilling of the river sediments is a straight forward operation. EPA is proposing Alternative C-7A because other alternatives involving treatment of oil saturated soils have not been proven successful at other Superfund sites. Specialty services required for installation of the temporary Sheet Pile Cofferdam and the permanent Sheet Pile Wall and Oil-water Separators are commercially available.

#63 **Cost.** EPA's investigation has shown that potential off-site disposal facilities that are licensed for acceptance of PCB-containing wastes are available, and disposal of the estimated soil volume will cost $2,422,323. The combined cost for the proposed alternative has been estimated at $17,168,000. This represents the removal of the worst areas of contamination, the removal of the contaminated River Sediment Areas and the collection of the oil discharged to prevent recontamination. EPA is proposing Alternative C-7A because it is protective of human health and the environment and its cost is less than other alternatives whose effectiveness has not been proven.

State Agency Acceptance. PADEP acceptance of the proposed alternative will be evaluated after the public comment period ends, and will be described in the ROD Responsiveness Summary.

Community Acceptance. Community acceptance of the proposed alternative will be evaluated after the public comment period ends, and will be described in the ROD Responsiveness Summary.

VI. COMMUNITY PARTICIPATION

EPA solicits input from the community on the cleanup methods proposed for each Superfund response action. EPA has set a public comment period from July 20 through August 19, 1995, to encourage public participation in the selection process. The comment period includes a public meeting at which EPA will present the RI/FS Reports and Proposed Plan, answer questions, and accept both oral and written comments.

ABBREVIATIONS

AWQC	Ambient Water Quality Criteria
ARARs	Applicable or Relevant & Appropriate Requirements
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation & Liability Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
DNAPL	Dense Non-Aqueous Phase Liquid
EEC	Environmental Effects Criteria
EEQ	Environmental Effects Quotient
EPA	Environmental Protection Agency
HI	Hazard Index
HQ	Hazard Quotient
HRS	Hazard Ranking System
LNAPL	Light Non-Aqueous Phase Liquid
MCLs	Maximum Contaminant Levels
MW	Monitoring Well
NAPL	Non-Aqueous Phase Liquid
NCP	National Contingency Plan [or National Oil and Hazardous Substances Pollution Contingency Plan]
NOAA	National Oceanic & Atmospheric Administration
NPL	National Priorities List
OSWER	Office of Solid Waste and Emergency Response
PA	Pennsylvania
PADER	Pennsylvania Department of Environmental Resources
PAHs	polynuclear aromatic hydrocarbons
PCBs	Polychlorinated Biphenyls
ppb	Parts Per Billion
ppm	Parts Per Million
PRPs	Potentially Responsible Parties
RCRA	Resource Conservation & Recovery Act
RD/RA	Remedial Design/Remedial Action
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SVOCs	Semi-Volatile Organic Compounds
TAL/TCL	Target Analyte List/Target Compound List
TPHs	Total Petroleum Hydrocarbons
TSCA	Toxic Substances Control Act
ug/cm^2	micrograms per square centimeter
USCG	United States Coast Guard
VOCs	Volatile Organic Compounds

A public meeting is scheduled for 7:30 PM on July 27, 1995, and will be held at the Disston Recreation Center, 1511 Disston Street, Philadelphia, Pennsylvania. The Disston Recreation Center is located approximately 2000 feet (or 1/2 mile) northwest of the Site, and off of Interstate I-95 (see Figure 1).

Comments will be summarized and responses provided in the Responsiveness Summary section of the ROD. The ROD is the document that presents EPA's final selection for cleanup. To send written comments or obtain further information, contact:

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Attachment B

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